

AGENDA
California Nonpoint Source Tracking and Monitoring Council
July 20, 2005
CalEPA Building - Training Room 2 (East and West)
1001 I Street, Sacramento

***TMC Mission:** To help improve implementation tracking and water quality monitoring to enhance local, state, federal, tribal and private efforts to address nonpoint source pollution and protect designated uses.*

1. Introduction (9:00 – 9:30)

-Facilitator, Sam Ziegler, USEPA

2. Statewide Strategy for Water Quality Monitoring (9:30 – 10:30)

- Presentation by Val Connor, SWRCB (20 minutes)

- ***Desired Outcomes:** Identify activities to enhance strategy and explore how organizations other than SWRCB/RWQCBs fit into the statewide strategy.*

3. California Environmental Data Exchange Network (10:30 – 11:30)

- Presentation by Karl Jacobs, DWR (20 minutes)

- ***Desired Outcomes:** Identify activities to facilitate the exchange of water and environmental data between groups and to provide access to the public.*

Lunch (11:30 – 12:30)

4. Updates (12:30 – 1:00)

- SB1070 (State Monitoring Council) – Linda Sheehan, California CoastKeeper Alliance
- Monitoring & Project Performance Workshops – Mike Connor, SFEI
- Other

5. Agricultural Water Quality Monitoring, Management Measure Tracking and Data Management in the Central Coast Region (1:00 – 2:00)

- Presentation by Karen Worcester, CCRWQCB (20 minutes)

- ***Desired Outcomes:** Identify how to transfer Central Coast activities, as appropriate, to other regions. Identify other management measure tracking activities and how tracking can be expanded to other management measures categories (e.g., urban, marinas, wetlands, forestry). Identify activities to enhance Central Coast monitoring.*

6. Indicator Development: Bio-Assessment (2:00 – 3:00)

- Presentation by Terry Fleming, U.S. EPA and Andy Rehn, CDFG (20 minutes)

- ***Desired Outcomes:** Identify how to enhance bio-assessment activities underway to portray statewide water quality status and trends. Explore approaches to determine relationships between impairments and land use categories, and increase usefulness of bio-assessment tools for NPS management.*

7. Wrap-Up/Next Steps (3:00 – 3:30), Sam Ziegler, USEPA

1
2
3
4
5 State Water Resources Control Board and
6 Regional Water Quality Control Water Boards
7

8
9
10 Surface Water Ambient Monitoring Program (SWAMP)
11 Comprehensive Monitoring and Assessment--
12 “10 Elements” Implementation Strategy
13 July 2005
14

15 DRAFT
16
17

This draft Strategy document is currently undergoing review and will be revised based on review comments. This is a draft document. Please do not cite or distribute.

Table of Contents

Acknowledgment	4
Preface	5
Executive Summary	7
Table of Contents	2
List of Tables	
List of Abbreviations	13
1. Strategy	14
Key Components and Essential Attributes	14
Goals and Objectives	14
Current Status	15
Implementation Priorities	15
2. Monitoring Objectives	17
Key Components and Essential Attributes	17
Goals and Objectives	18
Current Status	19
Implementation Priorities	19
3. Monitoring Design	20
Key Components and Essential Attributes	20
Goals and Objectives	21
Current Status	22
Implementation Priorities	23
4. Indicators	24
Key Components and Essential Attributes	24
Goals and Objectives	24
Current Status	25
Implementation Priorities	27
5. Quality Assurance	28
Key Components and Essential Attributes	28
Goals and Objectives	29
Current Status	29
Implementation Priorities	31
6. Data Management	33
Key Components and Essential Attributes	33
Goals and Objectives	33
Current Status	34
Implementation Priorities	35
7. Data Analysis and Assessment	36
Key Components and Essential Attributes	36

65	Goals and Objectives	36
66	Current Status	36
67	Implementation Priorities	37
68		
69	8. Reporting	38
70	Key Components and Essential Attributes	38
71	Goals and Objectives	38
72	Current Status	39
73	Implementation Priorities	39
74		
75	9. Programmatic Evaluation	40
76	Key Components and Essential Attributes	40
77	Goals and Objectives	40
78	Current Status	40
79	Implementation Priorities	41
80		
81	10. General Support and Infrastructure Planning	42
82	Key Components and Essential Attributes	42
83	Goals and Objectives	42
84	Current Status	42
85	Implementation Priorities	43
86		
87	Core Implementation Tactics	44
88		
89	Literature Cited	49
90		
91	Appendices	
92		
93	A. SWAMP Report Card	
94	B. Summary of SWAMP Goals and Objectives	
95	C. Summary of Regional Water Board Goals and Objectives	
96	D. Summary of Monitoring Activities of the Nonpoint Source (NPS) program	
97	a. California NPS Management Program Tracking & Monitoring Objectives	
98	b. California Nonpoint Source Tracking and Monitoring Council Charter	
99	E. Policy for Developing California's CWA Section 303(d) List	
100	F. Supplemental Information for SWAMP Roundtable	
101	a. National Water Quality Monitoring Council (NWQMC) framework	
102	b. Monitoring in the 21 st Century to Address our Nation's Water-resource Questions	
103	(USGS congressional briefing)	
104	c. Moving from Monitoring to Prediction: The Quality of the Nations Streams (USGS	
105	congressional briefing)	
106	d. Sections of the CA Water Code that pertain to ambient monitoring	
107	e. Working Definitions for Key Words and Concepts	
108	f. Draft Senate Bill 1070	
109		

Acknowledgements

Coordination and collaboration promote consistency and minimize duplication of effort. In that spirit, this document borrows liberally from the work of others. Most of the elements of SWAMP have been patterned after successful efforts being implemented by individual regions, other agencies and other states. The result of this is a stronger, more cost effective program in terms of design and implementation. In particular, Terry Fleming at the U.S. Environmental Protection Agency, Region 9 (USEPA), the members of the SWAMP Roundtable, and the National Water Quality Monitoring Council (NWQMC) have influenced the development of this document.

This document incorporates and builds on two previous reports on SWAMP that were submitted to the California Legislature in January and November 2000.

Preface

Water is California's most precious resource, providing an essential lifeline between agriculture, industry, the environment, and urban and rural interests throughout the state. With a growing population of more than 35 million, and a limited supply of fresh water, the protection of water for beneficial uses is of paramount concern for all Californians. The State Water Resources Control Water Board (Water Board) and the Regional Water Quality Control Water Boards (Regional Water Boards) "are responsible for protecting California's water resources" (Water Boards Strategic Plan, November 2001). Our approach to protection is summarized in the 2002 Strategic Plan for the Water Boards. Overarching elements of the Strategic Plan are repeated here to place the SWAMP Implementation Strategy (Strategy) in the proper context.

Our vision is a sustainable California made possible by clean water and water availability for both human uses and environmental resource protection.

Our mission is to preserve, enhance, and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations.

Our operating principles clarify how we intend to interact with internal and external stakeholders, defining our roles and responsibilities and approaches to decision-making. These operating principles address several areas that we aim to strengthen to improve our effectiveness. The following principles from the Strategic Plan are incorporated into the Strategy where appropriate:

- The State and Regional Water Boards (Water Boards) will seek consistent approaches to policy and Program implementation, recognizing the distinct obligations, issues, and authorities of each Water Board.
- The Water Boards will enforce water laws and regulations in a consistent, predictable, fair, and equitable manner.
- The Water Boards will collaborate with agencies and other key stakeholders to effectively address issues.
- The Water Boards will provide education and outreach opportunities so that Californians understand their responsibilities and abilities to protect water quality.
- The Water Boards will take a watershed approach to decision-making and program development.
- The Water Boards will make timely decisions based on:
 - Input from fair and open public processes;
 - Consideration of a decision's impact on stakeholders and the environment;
 - Best available scientific and technical data;
 - Best judgment;
 - Clear findings and conclusions based on a developed record.
- The Water Boards will utilize technology to increase the efficiency and effectiveness of limited resources.
- The Water Boards will provide staff with clearly defined and prioritized expectations.

The Strategic Plan contains six broad goals as listed below. Goal #6 focuses on monitoring and assessment. Goals #1 and 2 require monitoring and assessment activities.

Goal #1: The Water Boards' organizations are effective, innovative and responsive.

Goal #2: Surface waters are safe for drinking, fishing, swimming, and support healthy ecosystems and other beneficial uses.

Goal #3: Groundwater is safe for drinking and other beneficial uses.

Goal #4: Water resources are fairly and equitably used and allocated consistent with public trust.

Goal #5: Individuals and other stakeholders support our efforts and understand their role in contributing to water quality.

Goal #6: Water quality is comprehensively measured to evaluate protection and restoration efforts.

It is critical that we have the appropriate systems in place allowing us to assess and report on our progress toward improving and restoring California's water resources. At this time, we do not have enough monitoring resources to effectively evaluate the state's water quality. We will work with stakeholders to identify and implement additional monitoring resources. We will use measures to determine the effectiveness of our program activities and make modifications to improve that effectiveness. We will also work closely with stakeholders to develop and implement the most effective measurement and reporting tools so that we may communicate a consistent message regarding California's water quality. Included in this effort is our participation in the Cal/EPA Environmental Protection Indicators for California (EPIC) Project, which is developing environmental protection indicators for California. These indicators will be incorporated in future updates of the Strategic Plan and will be an integral part of our measurement processes.

The Strategic Plan states that we will achieve Goal #6 by pursuing the following measurable objectives:

- Increase the amount of useable, quantitative data and information regarding water quality.
- Translate quantitative data into useful information regarding the status of water quality.
- Coordinate the collection and reporting of water quality information among programs, agencies and stakeholders.

Further, the Strategic Plan proposes that these goals will be achieved by developing the systems and processes to measure and demonstrate quantitative improvements in, and maintenance of, water quality. A second emphasis is improving intra-agency, inter-agency and stakeholder coordination of programs and data sharing. All of these concepts have been incorporated into the Strategy described in this document.

Executive Summary

Adequate and accurate monitoring and assessment are the cornerstones to preserving, enhancing, and restoring water quality. The information gathered from monitoring activities is critical for protecting the beneficial uses of water; developing water quality standards; conducting federal Clean Water Act (CWA) assessments; and determining the effects of pollution and of pollution prevention programs.

In 2001 the Water Boards began implementation of the Surface Water Ambient Monitoring Program (SWAMP). SWAMP is envisioned to provide the Water Boards with comprehensive information on the status of beneficial uses in surface waters. The purpose of SWAMP is to provide a statewide framework for coordination of high quality, consistent and scientifically defensible methods and strategies to improve water quality monitoring, assessment and reporting. SWAMP is framed around beneficial use assessment and regulatory responsibilities. To meet CWA objectives, SWAMP will answer the following questions:

1. What is the overall water quality of the State's surface waters?
2. To what extent is surface water quality changing over time?
3. What are the problem areas and areas needing protection?
4. What level of protection is needed?
5. How effective are clean water projects and programs?

This report provides a roadmap for implementing a comprehensive surface water ambient monitoring program—the SWAMP Strategy (Strategy), including its essential attributes and key components. It presents the status of the current program. It defines and highlights the priorities that need to be addressed over the next three years. It is recognized that full implementation of the Strategy will require ten years and significant additional resources. It is envisioned that this Strategy will help generate a state-level commitment to better water quality monitoring by providing a “blue print” for improvement.

Ten Elements of a Water Quality Monitoring and Assessment Program. The CWA gives States and Territories the primary responsibility for implementing programs to protect and restore water quality, including monitoring and assessing the nation's waters and reporting on their quality. CWA Section 106(e)(1) requires USEPA to determine that a State is monitoring the quality of navigable waters, compiling and analyzing data on water quality, and including it in the State's Section 305(b) report prior to the award of Section 106 grant funds. The Water Boards are required to submit a monitoring strategy consistent with the guidance provided by USEPA in the document, “Elements of a State Water Monitoring and Assessment Program” (USEPA 2003) (USEPA Elements document). This document recommends the basic elements of a State water quality monitoring program and serves as a tool to help USEPA and the States determine whether a monitoring program meets the prerequisites of CWA Section 106(e)(1). The USEPA Elements document recommends that a state's monitoring and assessment program be fully implemented within ten-years, and includes ten essential elements. The elements recommended by USEPA are widely recognized as important attributes of any large monitoring program. Each of the ten elements is summarized briefly below, with particular emphasis on the aspects of each element identified by USEPA as critical components of an acceptable strategy. SWAMP is currently not addressing all the elements to the level advocated by USEPA. Appendix A contains the USEPA evaluation criteria for a State's monitoring and assessment program.

For each element USEPA identifies four levels of development for a state program. Using these evaluation criteria, we have included a “self appraisal” or “report card” of the current status of SWAMP and our ability to make progress on implementation. (Appendix A)

1. Strategy. Our vision is that water quality is comprehensively¹ measured to protect beneficial uses, and that our protection and restoration efforts are adequately evaluated. This will require a comprehensive SWAMP strategy to meet the water quality management needs of the Water Boards, and address all California surface waters, including streams, rivers, lakes, reservoirs, estuaries, coastal areas, and wetlands. This document lays out a preliminary strategy to be further developed by the SWAMP Roundtable². The SWAMP Strategy is a long-term plan, including a ten-year schedule for complete implementation. The strategy is comprehensive in scope, covering monitoring objectives, monitoring design, water quality indicators, quality assurance, data management, data analysis/assessment, reporting, programmatic evaluation, general support and infrastructure planning. The existing SWAMP program being implemented by the Regional Water Boards consists of 12 separate programs focused on regional priorities, but unified by a common set of field methods, quality assurance guidelines and data management. Regional Water Board staffs have been reluctant to develop a broader strategy because no resources have been identified for implementation. In FY05-06, the SWAMP Roundtable will refine the strategy outlined in this document as the essential first step to secure the additional resources to allow comprehensive monitoring.

2. Monitoring Objectives. Our vision is to define a complete set of monitoring objectives, based on beneficial use attainment, and reflecting the full range of regulatory responsibilities and water quality programs for all water bodies. In November 2000, SWAMP identified monitoring objectives critical to the design of a monitoring program that is efficient and effective in generating data that serve management decision needs. Monitoring objectives include helping to establish water quality standards, determining water quality status and trends, identifying impaired waters, identifying causes and sources of water quality problems, implementing water quality management programs, and evaluating program effectiveness. Consistent with CWA, monitoring objectives reflect the decision needs relevant to all types of State waters. These objectives are summarized in the November 2000 Report to the Legislature³.

In FY 01-02, resource limitations prompted a prioritization of objective implementation. The SWAMP Roundtable prioritized regional objectives over statewide status and trend questions. Although they are focused on beneficial use status, none of the regions are currently using the original objectives to drive the design of their monitoring programs. This is primarily attributable to a lack of sufficient resources to do this in a scientifically defensible manner. We do not have the resources to ask broad questions about beneficial use status across multiple types of water bodies. For example, instead of being able to ask (and answer) if waters are “fishable”, the best we can do is see if there is any evidence that suggests waters are not “fishable”. The SWAMP Roundtable acknowledges that we are not monitoring in a way that allows us to meet the objectives established in 2000. The Roundtable

¹ Comprehensive implies that all water body types are monitored to assess all applicable beneficial uses to meet all CWA objectives.

² The SWAMP Roundtable is the coordinating entity for the program. Participants include staff from the State and Regional Water Boards, the Department of Fish and Game, the Marine Pollution Studies Lab, Moss Landing Marine Laboratories, contractors, and other interested entities.

³ To view the Report to the Legislature, see: http://www.waterboards.ca.gov/legislative/docs/2000/Water_Board_monitoring_rpt1100.pdf

began redefining short-term objectives during FY 04-05 and will prioritize long-term objectives coupled to appropriate monitoring designs in FY 05-06.

3. Monitoring Design. Our vision is a monitoring design that maximizes our ability to meet our monitoring objectives with existing resources. The current design is a combination of (1) statewide monitoring to provide a picture of the status and trends in water quality and (2) site-specific monitoring to better characterize problem and clean locations. This approach balances these two important monitoring needs of the Water Boards and serves as a unifying framework for the monitoring activities being conducted. Several additional monitoring studies will be developed after monitoring objectives are prioritized. These studies will be drafted in the form of funding proposals to increase the likelihood of securing resources. The current and future SWAMP monitoring program will need to integrate several monitoring designs (e.g., fixed station, intensive and screening-level monitoring, rotating basin, targeted and probability designs) to meet the full range of decision needs. The current core program consists of watershed assessments designed and implemented by each Regional Water Board. The proposed SWAMP monitoring design also includes a probability-based network for making statistically valid inferences about the condition of all State water types, over time. At this time, the only probability-based monitoring that has been funded is to assess coastal waters and wadeable streams. The overall monitoring design also proposes the use of mathematical models to extend our assessment capabilities.

4. Water Quality Indicators. Our vision is to develop a set of monitoring indicators (and assessment thresholds), which can be used to track the status and trends of water quality, and to evaluate the effectiveness of management actions to improve water quality in the State. SWAMP currently uses core indicators selected to represent each applicable designated use, plus supplemental indicators selected according to site-specific or project-specific decision criteria. Core indicators for each water resource type include physical/habitat, chemical/toxicological, and biological/ecological endpoints as appropriate, and can be used to assess attainment with applicable water quality standards throughout the State. Supplemental indicators are used when there is a reasonable expectation that a specific pollutant is present in a watershed, when core indicators indicate impairment, or to support a special study such as screening for potential pollutants of concern. Development of biocriteria is a long-term goal, based on Indices of Biological Integrity (IBIs) that are currently being developed for specific ecoregions. In FY 05-06 we plan to refine development of core indicators that can transcend different spatial scales and integrate better with land use and landscape information. The development of monitoring designs to provide better EPIC indicators is also included in this Section.

5. Quality Assurance. Our vision is to develop and implement a progressive quality assurance (QA) program using a systems-based approach to the generation and storage of application-appropriate data/metadata. The program will emphasize science-based decisions and flexibility to adapt when scientific needs and budgetary challenges demand change. New methods and QA program changes will be evaluated with regard to SWAMP data quality objectives (DQOs). The QA program will solicit input from a variety of groups including other state programs, non-profit environmental organizations, and US EPA Region Nine.

The envisioned program will be flexible, well documented, and will include a “QA Toolbox,” web site, and a QA Expert Software System. In order to most efficiently use resources, SWAMP formed a QA Team lead by the SWAMP QA Officer. The SWAMP QA Officer will develop, maintain and implement 12 and 18-month task plans that will be assessed by the SWAMP Roundtable and other user groups. The QA Team consists of a QA Officer, QA Coordinator and several QA Specialists. The QA Officer reports to the SWAMP Program Coordinator and the Water Board QA Program Manager.

SWAMP has a quality assurance management plan (QMP) combined with a quality assurance program/project plan (QAPP) that were established in accordance with EPA policy to ensure the scientific validity of monitoring and laboratory activities, and to ensure that State reporting requirements are met with credible and comparable data. The existing Water Board QMP must be updated to include the SWAMP QMP/QAPP. Implementation of both plans needs to be evaluated. It is anticipated that both the Water Board and the SWAMP QMP/QAPP will be updated in FY05-06. The SWAMP QA Team will oversee revision of the SWAMP QMP/QAPP while the Water Board QA Program Manager is responsible for the Water Board QMP. In FY05-06, the SWAMP QMP/QAPP and its implementation will be evaluated as part of the Scientific Planning and Review Committee's (SPARC) external peer review of the entire SWAMP program.

6. Data Management. Our vision is to make credible ambient monitoring data available to all stakeholders in a timely manner. SWAMP is completing development of an accessible electronic data system for water quality, fish tissue, toxicity, sediment chemistry, microbiology, habitat, and biological data, with appropriate metadata (consistent with the recommendations of the NWQMC) and geolocal standards. Database support and training are provided to SWAMP users and other program users to achieve data comparability among Water Board programs. Additionally, SWAMP data will be made available to the public through the California Environmental Data Exchange Network (CEDEN) web site maintained by the Department of Water Resources and Moss Landing Marine Laboratories. Beginning in FY06-07, SWAMP monitoring data will be uploaded into the USEPA's STORET and Exchange Network national systems through CEDEN. The long-term goal of the Water Boards is to include SWAMP in the California Integrated Water Quality System (CIWQS).

For CWA Section 305(b) reports and 303(d) lists, assessment information is currently being stored in the Water Board's GeoWBS system. GeoWBS is being incorporated into CIWQS. GeoWBS is based on the USEPA Assessment Database and defines the geographic location of assessment units using the National Hydrography Dataset (NHD). The database includes sufficient descriptive metadata for the data to be shared and compared among managers and the public. GeoWBS functionality in CIWQS is planned for FY06-07.

7. Data Analysis/Assessment. Our vision is to provide a consistent defensible framework for the evaluation of monitoring data relative to state and regional standards, the protection of beneficial uses and for tracking the effectiveness of management actions. Regional Water Board staffs are responsible for preparation of technical reports that summarize the findings of their watershed assessments. State Water Board staff is responsible for technical reports that summarize the findings of statewide assessments. This information is used in the preparation of CWA Section 305 (b) reports and 303(d) listings.

The State Water Board recently adopted a Water Quality Control Policy (2005) (Policy) outlining how to assess attainment of water quality standards based on analysis of various types of data (chemical, physical, and biological) from various sources, for all State waters. The Policy establishes listing and delisting criteria for establishing the Section 303(d) list. It also contains criteria to assist in establishing priorities for developing Total Maximum Daily Loads (TMDLs), guidelines for acceptability of data, and other measures necessary to facilitate the completion of TMDLs. An assessment methodology is being developed for classifying beneficial use status for individual water bodies that will integrate with the new listing policy. Beginning in 2007, the new methodology will be used for generating California's Integrated Report to satisfy the requirements of both CWA Section 305(b) and 303(d).

8. Reporting. Our vision is to report all collected data as information, and in a timely and publicly accessible manner. A variety of reports are used to support SWAMP. The reports will be available to the public in paper and electronic form. The types of reports being produced include fact sheets, data reports, QA reports, interpretative reports, and the 305(b)/303(d) Integrated Report. These reports provide an analysis and interpretation of the data collected. The technical reports have written descriptions of the study design, methods used, graphical, statistical, and textual descriptions of the data, and interpretation of the data including comparisons to relevant water quality goals. SWAMP reports will be made available to all interested parties through the State Water Board's web site (<http://www.waterboards.ca.gov>). Technical reports are being summarized in fact sheets that capture key findings in a more readable format.

The State needs to improve its ability to produce timely, complete and technically valid water quality reports and lists called for under CWA Sections 305(b) and 303(d). The Policy and the upgrade to GeoWBS should facilitate this. To remain eligible for Section 106 grants, the State also must submit annual updates of water quality information. This requirement will be satisfied by annually updating monitoring data to the national STORET database and the USEPA's Exchange Network via the CEDEN exchange network.

9. Programmatic Evaluation. Our vision is to conduct periodic reviews of each aspect of the program to determine its scientific validity, if it is being implemented as designed, and how well it serves the water quality decision needs of the State. The SWAMP Program, in consultation with its external SPARC, will conduct external peer reviews of each element in this strategy every three to five years to determine how well the program serves its water quality decision needs. This will involve evaluating both the state and regional monitoring programs to determine how well each of the elements is being addressed, and determining how needed changes and additions should be incorporated into future monitoring cycles. The SPARC will be comprised of independent scientific and technical experts including, but not limited to, representatives from federal and state agencies and academics with expertise in fields such as monitoring program management, monitoring design, ecology, chemistry, quality assurance, pathogens, toxicology and statistics. The next SPARC review is planned for FY05-06.

Regional Water Boards have obtained technical input and review of their programs in a variety of ways including the formation of technical advisory committees and external peer reviews. However, this input has been optional and uncoordinated at the program level. Beginning in FY 05-06, external peer review will be incorporated into the preparation of monitoring plans and technical reports. These reviews will be coordinated through the State Water Board.

10. General Support and Infrastructure. Our vision is to provide the support needed to implement a coordinated and comprehensive monitoring and assessment program. To accomplish this will require significant additional resources. SWAMP resource needs were identified in November 2000. This resource assessment should be updated to describe the funding and staff needed to implement the proposed strategy. In addition to quantifying staff and contract resources, other requirements including training, laboratory resources, and infrastructure needs should be described. This will be completed during FY 06-07.

Strategy Implementation Tactics. Currently, the Strategy integrates four overarching tactics to promote an efficient increase in the amount of usable water quality information that is available:

- 442 • Improve and strengthen SWAMP so that all Water Board programs generate scientifically
443 defensible, comparable and comprehensive information by using a monitoring framework and data
444 standards consistent with the guidance developed by the NWQMC.
- 445 • Develop and promote the use of multiple monitoring tools such as statistically based surveys,
446 judgmental surveys, predictive modeling, risk assessments, expert systems, and newer information
447 and monitoring technologies.
- 448 • Continue working with monitoring programs currently coordinated through the California
449 Environmental Data Exchange Network hosted by the Department of Water Resources. This
450 coordination will increase data comparability, increase the potential for true collaboration with
451 other entities collecting ambient water quality information and will make data available to the
452 public. (This third tactic will also contribute to the fourth tactic below.)
- 453 • Build stronger partnerships with agencies, watershed groups, citizen monitors, and others to
454 facilitate the sharing of information, the collection of comparable data and the use of monitoring
455 tools. This includes working closely with the newly formed Nonpoint Source Tracking and
456 Monitoring Council.
457

List of Abbreviations

457	
458	
459	BMP----- Best Management Practices
460	CEDEN----- California Environmental Data Exchange Network
461	CERES----- California Environmental Resource Evaluation System
462	CIWQS----- California Integrated Water Quality System
463	CMAP----- California Monitoring and Assessment Program
464	CWA-----Clean Water Act
465	DQIs-----Data quality indicators
466	DQOs----- data quality objectives
467	EDF----- Electronic Data Formats
468	EIEN----- Environmental Information Exchange Network
469	EMAP-West----- Environmental Monitoring and Assessment Program Western Pilot
470	EPIC----- Environmental Protection Indicators for California
471	ESMR -----Electronic Self-Monitoring Reporting
472	FY-----Fiscal Year
473	GAMA----- program for statewide monitoring of groundwater resources
474	GeoWBS-----Geospatial Waterbody System
475	IBI----- Indices of Biological Integrity
476	ITFM----- Intergovernmental Task Force on Monitoring
477	LUFT----- Leaking underground fuel tank
478	MCLs----- maximum contaminant levels
479	MLML-- Moss Landing Marine Laboratories
480	NHD----- National Hydrography Dataset
481	NPDES----- National Pollution Discharge Elimination System
482	NPS-----Non-Point Source
483	NWQMC----- National Water Quality Monitoring Council
484	PDA----- Personal Digital assistant
485	PAG-----Public Advisory Group
486	QA----- quality assurance
487	QAPP----- quality assurance program/project plan
488	QC----- Quality Control
489	QMP--- Quality Management Plan
490	SCCWRP-- Southern California Coastal Water Research Project
491	SDTP -----standardized data transfer protocols
492	SFEI-- San Francisco Estuary Institute
493	SMW -----State Mussel Watch
494	SOPs----- Standard Operating Procedures
495	SPARC----- Scientific Planning and Review Committee's
496	SWAMP----- Surface Water Ambient Monitoring Program
497	SWIM1----- System for Water Information Management
498	TAC----- technical advisory committees
499	TMDLs-----Total Maximum Daily Loads
500	TSM----- Toxic Substances Monitoring
501	USEPA----- U.S. Environmental Protection Agency, Region 9
502	VOCs----- volatile organic compounds
503	WDPF----- Waste Discharge Permit Fees
504	WDR----- Waste Discharge Requirements
505	

Strategy

Key Components and Essential Attributes

Our vision is that water quality is comprehensively measured to protect beneficial uses, and to evaluate our protection and restoration efforts. This requires a comprehensive strategy that serves all water quality management needs and addresses all State waters, including all water body types (e.g., streams, rivers, lakes, reservoirs, estuaries, coastal areas, and wetlands). The strategy is a long-term implementation plan and includes a ten-year timeline. The SWAMP strategy is built on the three existing prioritization efforts that include commitments made by the Water Boards. These include the Water Board's 2002 Strategic Plan, the 2003 Partnership Agreement with USEPA and the Governor's Action Plan for the Environment.

Goals and Objectives⁴

To ensure the comprehensive nature of the strategy, ten long-term vision statements were refined and endorsed by the SWAMP Roundtable in April 2004. A vision statement was developed to guide the implementation of each of the ten elements of the strategy. These are summarized, below.

Our vision is:

- That water quality is comprehensively measured to protect beneficial uses, and to evaluate our protection and restoration efforts.
- To define a complete set of monitoring objectives, based on beneficial use attainment, and reflecting the full range of regulatory responsibilities and water quality programs for all water body types.
- To develop and implement a monitoring design that maximizes our ability to meet our monitoring objectives with existing resources.
- To develop and implement a set of monitoring indicators (and assessment thresholds), which can be used to track the status and trends of water quality and to evaluate the effectiveness of management actions to improve water quality in the State.
- To develop and implement a progressive QA program using a systems-based approach to the generation and storage of application-appropriate data/metadata.
- To make credible ambient monitoring data available to all stakeholders in a timely manner.
- To provide a consistent defensible framework for the evaluation of monitoring data relative to state and regional standards, the protection of beneficial uses and for tracking the effectiveness of management actions.
- To report all collected data as information, and in a timely and publicly accessible manner.
- To conduct periodic reviews of each aspect of the program to determine its scientific validity and how well it serves the water quality decision needs of the State.
- To provide the support needed to implement a coordinated and comprehensive monitoring and assessment program.

⁴ Consistent with the Water Board's Strategic Plan (November 2001), a goal is the desired end result which: a) addresses the key strategic issues; b) identifies what we want to achieve; c) provides a framework for more detailed, tactical planning; and d) will remain the same for 3 – 5 years. An objective is a specific, measurable target for accomplishing a goal which: a) describes a specific accomplishment (not the way to accomplish a goal); b) focuses on a result to be achieved; and c) will be accomplished within one to three years.

Specific goals and objectives for implementing the strategy will be identified in the appropriate sections. A summary of the current SWAMP goals and objectives is in Appendix B.

Goal: Develop SWAMP monitoring strategy

- Prepare draft strategy
- Finalize strategy

Goal: Implement SWAMP monitoring strategy

- Develop annual workplan(s)
- Develop 3-year workplan
- Develop and Implement Process for periodic evaluations and updates

Goal: Promote Coordination and Comparability

- Continue monthly meetings of SWAMP Roundtable.
- Establish a stakeholder group to providing guidance to Roundtable.
- Actively participate in the NPS Tracking and Monitoring Council.
- Engage regulated community to maximize National Pollution Discharge Elimination System (NPDES) and Waste Discharge Requirements (WDR) monitoring comparability with SWAMP.
- Expand the role of Volunteer Monitoring and the Clean Water Team in SWAMP.
- Continue participation in NWQMC.
- Identify, develop and implement joint projects with partners.
- Participate in web-based applications for tracking monitoring entities.
- Expand SWAMP component of Water Board Training Academy to include courses for all stakeholders and interested parties.

Current Status

Monitoring and assessment activities have been ongoing at the regional level since FY01-02. Most Regions are implementing a targeted design that provides information on existing conditions in watershed assessment units. Ideally a Region would monitor 20% of their watersheds annually, rotating through all watersheds on a five year cycle. The size and complexity of several Regions does not allow for all watersheds to be monitored on a five year cycle.

When the SWAMP program was originally designed it was envisioned to provide information for all the Water Board's decision-making needs. It was estimated that the program would cost between \$59 to \$115 million per year, including 87 to 132 staff positions. The current program is funded at \$3.4 million and 17 staff positions or approximately seven percent of what is needed. With the existing budget, the program has focused on gradually developing the necessary "infrastructure" for comparable monitoring. Emphasis has been on the development of standard field procedures, a strong Quality Assurance program and a fully functional database. The rate of program development has been balanced against the need for regional monitoring. It is anticipated that the systems necessary for generating comparable information will be completed in FY07-08.

Implementation Priorities

Implementation priorities for the next three years are covered in each of the remaining sections of this report. Activities that involve multiple strategy elements are summarized in a single section, following

595 the ten elements. Priorities include continued monitoring, refining the Strategy, conducting and
596 responding to an external peer review, and assessing the data collected during the first five years of the
597 program.
598
599

Monitoring Objectives

Key Components and Essential Attributes

Our vision is to define a complete set of monitoring objectives, based on beneficial use attainment and other water quality objectives, and reflecting the full range of regulatory responsibilities and water quality programs for all water bodies.

SWAMP has identified state and regional monitoring objectives critical to the design of a monitoring program that is efficient and effective in generating data that serve its management decision needs. These objectives are the foundation of a monitoring program that reflects the full range of Water Board water quality management objectives including, but not limited to, CWA goals. Consistent with the CWA, monitoring objectives reflect the decision needs relevant to all types of waters of the United States, including streams, rivers, lakes, reservoirs, estuaries, coastal areas, and wetlands.

Clean Water Act objectives include:

- Establishing, reviewing, and revising water quality standards (Section 303(c)).
- Determining water quality standards attainment (Section 305(b)).
- Identifying impaired waters (Section 303(d)).
- Identifying causes and sources of water quality impairments (Sections 303(d), 305(b)).
- Supporting the implementation of water quality management programs (Sections 303, 314, 319, 402, etc.).
- Supporting the evaluation of program effectiveness (Sections 303, 305, 402, 314, 319, etc.).

In general, a monitoring program that meets CWA objectives should be able to answer the following five questions:

1. *What is the overall quality of waters in the State?* CWA Section 305(b) requires that states determine the extent to which its waters meet the objectives of the CWA, attain applicable water quality standards, and provide for the protection and propagation of balanced populations of fish, shellfish, and wildlife (40 CFR 130.8).

2. *To what extent is water quality changing over time?* The Water Boards must assess and report on the extent to which control programs have improved water quality or will improve water quality for the purposes of “the protection and propagation of a balanced population of shellfish, fish, and wildlife and . . . recreational activities in and on the water” (40 CFR 130.8(b)(2) and 130.8(b)(1)). Under Section 319(h)(11) of the CWA, the Water Boards must report on reductions in nonpoint-source loadings and related improvements in water quality. Under Section 314(a)(1)(F), a State reports on the status and trends of water quality in lakes. The Water Boards should also be able to identify emerging environmental issues related to new pollutants or changes in activities within watersheds.

3. *What are the problem areas and areas needing protection?* Under Section 303(d), the Water Boards must identify impaired waters. The Water Boards should also identify waters that are currently of high quality and should be protected from degradation. In order to protect and restore waters, monitoring and assessment programs should identify the causes and sources of impairment.

4. *What level of protection is needed?* The USEPA and the Water Boards establish the level of protection that is being monitored against. For example, the Water Boards use data from monitoring programs to conduct triennial reviews of state water quality standards and Basin Plans, conduct use-attainability analyses, develop and adopt revised designated uses and water quality criteria, establish water quality-based effluent limits in NPDES permits, establish TMDLs, and assess which levels of Best Management Practices (BMPs) for NPS are most appropriate.

5. *How effective are clean water projects and programs?* The Water Boards should monitor to evaluate the effectiveness of specific projects and overall programs, including but not limited to Section 319 (nonpoint source control), Section 314 (Clean Lakes), Section 303(d) TMDLs, Section 402 NPDES permits, water quality standards modifications, compliance programs (Discharge Monitoring Report information), and generally to determine the success of management measures, especially those implemented with state funds.

At the Water Boards, these questions have centered on providing the answers needed for existing programs. The number of specific monitoring objectives is daunting. For example, implementation of CWA Section 303(d) is a top priority of the Water Boards. This requires the Water Boards to identify all water bodies that do not meet water quality standards. For those “impaired” water bodies failing to meet standards, the Water Board must establish TMDLs. TMDLs define how much of a specific pollutant a water body can tolerate and still meet relevant water quality standards. All of the combined pollution sources in a watershed may not discharge more than the TMDL limit. The establishment of TMDLs in California is one of the most significant and controversial efforts undertaken by the Water Boards. Not only do the TMDLs have to be established, but they must also be implemented by allocating responsibility for corrective measures among a variety of dischargers. Approximately 1,800 water body-pollutant combinations requiring TMDL development have been identified. The Regional Water Boards are committed to the development of 500 to 800 individual TMDLs over the next ten years, which will account for 1,500 of these water body-pollutant combinations. Significant monitoring resources will be required to accurately monitor and assess water bodies, work with stakeholders to develop and implement TMDLs, and subsequently determine the success of the TMDLs in restoring the State’s water to relevant standards.

Ultimately, monitoring objectives should be developed for all Water Board programs. Only the NPS program has developed a set of monitoring objectives to evaluate the effectiveness of the program.

Goals and Objectives

Goal: Define statewide monitoring objectives

- Review existing objectives (in Legislative Report).
- Provide recommendations for statewide monitoring objectives.

Goal: Define regional monitoring objectives

- Compile objectives from Regional Water Boards.
- Identify areas of overlap among regions and with state objectives

Goal: Develop consensus on shared objectives

694 Current Status

695

696 In November 2000 a comprehensive set of objectives was submitted to the State Legislature. In FY
697 01-02, resource limitations prompted a prioritization of objective implementation. The SWAMP
698 Roundtable prioritized regional objectives over statewide status and trend questions. Although they
699 are focused on beneficial use status, none of the Regional Water Boards are currently using the original
700 objectives to drive the design of their monitoring programs. This is primarily attributable to a lack of
701 sufficient resources to do this in a scientifically defensible manner. We do not have the resources to
702 ask broad questions about beneficial use status across multiple types of water bodies. For example,
703 instead of being able to ask (and answer) if waters are “fishable”, the best we can do is see if there is
704 any evidence that suggests waters are not “fishable”. The SWAMP Roundtable acknowledges that we
705 are not monitoring in a way that allows us to meet the objectives established in 2000. The Roundtable
706 began redefining short-term objectives during FY04-05 and will prioritize long-term objectives
707 coupled to appropriate monitoring designs in FY05-06. Until that task is completed, the primary
708 SWAMP effort will be a continued focus on existing regional objectives. Each Region has developed
709 a set of Regional monitoring objectives coupled to an appropriate monitoring design. This information
710 is summarized in Appendix C.

711

712 Specific monitoring objectives for most statewide programs are still needed. Only the California
713 Nonpoint Source Program has developed specific monitoring objectives that identify the Program's
714 data and information needs, and will be used to design and implement activities that will provide
715 information to better guide implementation of nonpoint source pollution control measures. These data
716 and information needs will be addressed through the SWAMP, and related monitoring and
717 implementation tracking activities. The NPS Monitoring objectives are included in Appendix D.

718

719 Implementation Priorities

720

721 The overall purpose of SWAMP is to provide the information needed for effective environmental
722 management. To be successful, the program must “translate” management information needs into
723 clear objectives that guide the design and implementation of state and regional monitoring. Clear
724 statements of information needs and objectives are important scientifically and managerially. In FY
725 04-05 the SWAMP Roundtable began the process of generating and collecting management
726 information needs. The Roundtable is using the combined science and management framework for
727 developing monitoring objectives that was developed by Bernstein, Thompson and Smith (1993). This
728 refining of objectives for all water body types will be completed in FY05-06. It must be emphasized
729 that the program still lacks the resources to conduct additional monitoring. However, once monitoring
730 objectives have been articulated, it may be possible to leverage existing resources to answer the highest
731 priority questions. It should also be possible to implement a monitoring design that maximizes our
732 ability to address the highest priority objectives.

733

734

735

736

Monitoring Design

Key Components and Essential Attributes

Our vision is to develop and implement a monitoring design that maximizes our ability to meet our monitoring objectives with existing resources. To achieve this, SWAMP needs an approach and rationale for selection of monitoring designs and sample sites to address current monitoring objectives. The current and future State monitoring program will integrate several monitoring designs to meet the full range of information needs. The current SWAMP monitoring design includes a statewide probability-based network that supports statistically valid inferences about the condition of California wadeable streams over time. SWAMP needs to use the most efficient combination of monitoring designs to meet statewide status and trend objectives for other types of water bodies. When developing designs to meet specific objectives an integrated design for assessing water quality incorporates multiple tools in a tiered approach to address management decisions at multiple scales. These tools include probabilistic designs, landscape and water quality modeling, and targeted site-specific monitoring. This tiered approach will enable the State to make statistically valid inferences of the extent that waters meet water quality standards, to predict which waters are most likely degraded or at risk for degradation, and to target site-specific monitoring needed to address local water quality concerns⁵. The efficiencies of an integrated design should extend beyond monitoring costs to program costs because it can help States prioritize which waterbodies need more immediate attention. The design should include a comprehensive approach to assessment using multiple indicators for all waters on a continuing basis. The elements of the monitoring design should support the State's estimation of the amount or percentage of waters that are impaired, for each waterbody type, with a high degree of confidence. To meet its monitoring objectives, the State should ensure that the selected monitoring design yields scientifically valid results and meets the needs of decision makers. The monitoring design should incorporate appropriate methods to control decision errors and balance the possibility of making incorrect decisions. The levels of precision and confidence should be appropriate to the monitoring objective and the type of data collected.

The SWAMP monitoring design will also take advantage of ongoing monitoring programs that meet or complement the SWAMP monitoring objectives. For example, the Water Boards have worked with local agencies to develop a statewide monitoring strategy for beaches under the Federal BEACH act. The State Water Board also has developed a program for statewide monitoring of groundwater resources (GAMA). These do not need to be repeated or replicated in the SWAMP program. Other agencies also conduct monitoring that can provide the information to answer SWAMP objectives. For example, the California Department of Fish and Game reports catch statistics, which can be used to assess the status of the fisheries resources off the coast. Similarly the SWAMP strategy is building upon Federal Programs such as the USEPA's Environmental Monitoring and Assessment Program Western Pilot (EMAP-West) to support assessment of streams and coastal waters for aquatic life use. To facilitate data sharing among programs, the SWAMP strategy calls for establishing objectives that are similar, ensuring that data quality is comparable, and integrating data standards to facilitate data exchange, so that assessments can be made. An inventory of existing monitoring should be conducted prior to designing additional monitoring elements.

⁵ A divisive ongoing debate in the SWAMP program centers on the use of probabilistic monitoring tools. Appendix F includes a copy of a USGS fact sheet prepared by Tim Miller for a Congressional briefing on February 25, 2005. It is a succinct summary of how different monitoring objectives require different monitoring tools.

781 Effective management of water quality will require a commitment not only to monitoring but also to
782 the development of predictive tools such as models. Models are needed to extrapolate measured water-
783 quality conditions to unmonitored, comparable areas. This ability to extrapolate or make predictions is
784 critical for cost-effective assessment. For example, the expense of monitoring limits the number of
785 stream miles that can be measured. As noted in the most recent 305(b) report, California has assessed
786 only 30 percent of the more than 211,500 stream miles in the state. “In addition, models can establish
787 linkages between water-quality conditions and contaminant sources on land; track contaminants from
788 their upstream origins to downstream destinations; and simulate changes in water quality resulting
789 from management actions or trends in human activities. Such information provides estimates of
790 conditions that often cannot be directly measured, such as the percentage of contamination in a stream
791 that originates from different sources or the effects of specific pollution controls.” (USGS 2005,
792 App. F.) SWAMP needs to include the use of models and other predictive tools into our monitoring
793 strategy and designs.
794

795 Goals and Objectives

796

797 **Goal: Refine management questions for assessing beneficial uses for all waterbody types.**

- 798 • Recreational uses (swimming)
 - 799 • Fishing uses
 - 800 • Aquatic life support
 - 801 • Drinking water use
- 802

803 **Goal: Inventory management questions of existing programs and monitoring entities**

- 804 • Identify programs collecting relevant data.
 - 805 • Establish coordination to promote data sharing.
- 806

807 **Goal: Develop strategy to answer assessment questions for each waterbody type.**

- 808 • Addressing rivers.
 - 809 • Addressing wadeable streams.
 - 810 • Addressing lakes and reservoirs.
 - 811 • Addressing marine coastal areas.
 - 812 • Addressing bays and estuaries.
 - 813 • Addressing wetlands.
- 814

815 **Goal: Design cost-effective monitoring program.**

- 816 • Develop designs to meet statewide monitoring objectives.
 - 817 • Develop framework for integrating Regional Water Board efforts into statewide program.
 - 818 • Develop framework for integrating other State Water Board efforts into statewide program.
 - 819 • Develop framework for integrating other monitoring efforts into statewide program.
- 820

821 **Goal: Develop and implement a suite of predictive tools to maximize our ability to effectively**
822 **manage water quality.**

- 823 • Develop process for incorporating use of models and other predictive tools into the existing
824 SWAMP strategy.
- 825
826
827

828 Current status

829

830 **Regional Designs**

831 Regional monitoring designs can be broadly classified as one of three types. Two regions are using a
832 probabilistic design to assess the overall status of their water bodies. Five regions are implementing a
833 targeted design that links water quality to land use. Three regions are conducting special studies to
834 develop appropriate indicators or support their TMDL program. A summary of the current regional
835 monitoring programs is included in Appendix C.

836

837 **Statewide Designs**

838

839 *Streams* The California Monitoring and Assessment Program (CMAP) for perennial wadeable streams
840 was initiated in 2003. The program builds on EMAP-West inland surface waters portion, implemented
841 in California from 1999 through 2003. The overall objective of the EMAP-West program was to
842 demonstrate an integrated comprehensive monitoring program within the western states to assess the
843 condition of perennially flowing rivers and streams using a survey-based (probabilistic) monitoring
844 approach. Samples were collected from a base statewide study of fifty probabilistically assigned sites
845 per year; additional probabilistic sites collected in study areas in southern (south coast and central
846 coast) and northern coastal California, and targeted reference sites. The current State effort (CMAP for
847 Perennial Streams) will be used to (a) provide a framework for producing valid assessments of
848 condition for perennial streams in California and (b) develop tools to facilitate these assessments.
849 CMAP is funded primarily through §319 Nonpoint Source funds. As part of this program, historic
850 EMAP-West data will be analyzed to produce baseline ecological assessments of the condition of
851 streams in the different study areas. In addition, a monitoring study that incorporates broad nonpoint
852 source land use categories (agriculture, forested, urban) will be implemented in order to assess aquatic
853 life beneficial use protection in streams. Assessments will be done using existing tools and through the
854 development of necessary assessment tools. The study uses a probabilistic monitoring design and
855 incorporates a core suite of indicators. Results will be included in the 305(b) Report.

856

857 *Coastal Waters:* The Southern California Coastal Water Research Program (SCCWRP) has partnered
858 with USEPA in the design and implementation of a probabilistic monitoring program to assess coastal
859 waters of the State. Through the EMAP Western Pilot the status of coastal estuaries of the state were
860 monitored in 1999 and 2000 and the status of the offshore coastal waters were assessed in 2003. The
861 results of these monitoring studies were used in the National Coastal Assessments. The results are also
862 being incorporated into the 305(b) report.

863

864 *Beaches:* State law mandates monitoring of recreational beaches in California. The monitoring is
865 implemented by County Health Agencies using funds distributed by the California Department of
866 Health Services. This is supplemented by the Federal Beach Act, which requires a statewide
867 monitoring strategy for coastal recreational beaches. The State has a 3-tiered monitoring strategy,
868 which requires daily to weekly sampling at all tier 1 beaches (high use and near pollutant sources as
869 defined by AB411), weekly sampling at tier 2 beaches (high use or near pollutant sources) and
870 minimal sampling at tier 3 beaches (low use and far from sources of pollution). The monitoring
871 information from these programs is submitted to the WATER BOARD on a monthly basis and to EPA
872 on an annual basis. Long-term trends are reported in the 305(b) report.

873

874 *Wetlands:* Wetland monitoring and assessment methodology development has received considerable
875 attention in recent years. A 3-tiered design is envisioned for wetland monitoring. Level 1 is broad
876 scale landscape assessment, which builds off recent improvements to the National Wetlands Inventory.

877 Level 2 is the rapid field assessment using the California Rapid Assessment Methodology (CRAM),
878 which would provide sufficient information for making assessments of wetland condition. Level 3 is
879 intensive site-level that would be of sufficient rigor for making regulatory decisions. Similar to the
880 monitoring network for wadeable streams, CRAM supports statistically valid inferences about wetland
881 condition. It would also allow for development of predictive tools from intensively studied sites.
882 Although funds are not currently available to implement a statewide wetland monitoring program at
883 this time, State and Regional entities (such as the Southern California Coastal Wetlands Recovery
884 Project, the San Francisco Estuary Project, and the California Coastal Conservancy) are working to
885 build the infrastructure to support the vision.

886
887 Implementation Priorities
888

889 Once monitoring objectives have been articulated, a set of monitoring designs can be developed for
890 both state and regional monitoring. The goal is to develop designs that answer specific management
891 questions at a certain scale, but also provide context for monitoring conducted at other scales.
892

893 Models are currently limited in use to the TMDL program. We recognize that models are powerful
894 tools, but we also recognize that models are incomplete tools without adequate monitoring to calibrate
895 and validate them. Over the next three years, if funding levels increase, the Roundtable would like to
896 evaluate the use of models to make predictions about the quality of waters that have not been assessed.
897 Appendix F includes a summary of the recent use of models by the US Geological Survey to
898 extrapolate water quality conditions.

Indicators

Key Components and Essential Attributes

Our vision is to develop and implement a set of monitoring indicators (and assessment thresholds), which can be used to track the status and trends of water quality and to evaluate the effectiveness of management actions to improve water quality in the State.

This requires that we define a core set of indicators (e.g., water quality parameters) for each water resource type that include physical/habitat, chemical/toxicological, and biological/ecological endpoints as appropriate, that reflect designated uses, and that can be used routinely to assess attainment with applicable water quality standards throughout the State. This core set of indicators must be monitored to provide Statewide or basin/watershed level information on the fundamental attributes of the aquatic environment and to assess water quality standards attainment/impairment status.

We should also describe a process for identifying supplemental indicators to monitor when there is a reasonable expectation that a specific pollutant may be present in a watershed, when core indicators indicate impairment, or to support a special study such as screening for potential pollutants of concern and emerging contaminants. Supplemental indicators are often key to identifying causes and sources of impairments and targeting appropriate source controls. The use of supplemental indicators is as important as the use of core indicators.

Goals and Objectives

Goal: Define core indicators for statewide monitoring and assessment for each designated use.

Objectives:

- Review existing indicators from the USEPA, the Report to the Legislature and Environmental Protection Indicators for California (EPIC)
- Provide recommendations on core indicators for statewide assessment
- Recommend appropriate design for assessing EPIC Indicators
- Recommend assessment thresholds for statewide assessment

Goal: Recommend set of core and supplemental indicators for use at local watershed scale.

Objectives:

- Review indicators used by Regional Water Board efforts and other entities
- Recommend core set of indicators for local assessment
- Recommend supplemental set of indicators for local assessment
- Recommend appropriate monitoring design for local indicators

Goal: Develop a set of locally appropriate Indices of Biological Integrity (IBIs)

Objectives:

- Summarize existing biological assessment information for California.
- Conduct a performance-based methods comparison.
- Recommend appropriate methods for specific stream type.

- Determine reference conditions, as appropriate.
- Develop IBIs

Current Status

In November 2000, SWAMP proposed a tiered approach to monitoring that included a core set of baseline indicators selected to represent each applicable designated use, plus supplemental indicators selected according to site-specific or project-specific decision criteria. These indicators are essentially the same ones suggested by USEPA and are summarized in Table 1. Progress in monitoring these indicators has been limited by funding constraints.

Stream indicators. Since its inception in 2000, SWAMP has made considerable progress in advancing bioassessment and monitoring. In 2001, staffs from the Water Boards formed a SWAMP Bioassessment Committee that has served to coordinate bioassessment efforts throughout the State. Prior to that time, there were numerous methods being used for bioassessment by various entities throughout the State. The Committee worked to conduct and evaluate rigorous “methods comparison” studies to determine the most cost-effective methods for wadeable streams, and then collaborated with bioassessment practitioners throughout the State to obtain consensus for using consistent methods for bioassessment sampling. The methods comparison studies have been submitted to scientific journals for publication, and there is now wide agreement on a single consistent method for use in most streams in California. At this writing, the Committee is continuing its efforts to coordinate selection of consistent bioassessment methods for low-gradient streams, and measurement of physical habitat parameters.

Bioassessment has also been used during the first five years of the SWAMP program to develop indices of biological integrity (IBIs) for several areas: South-Central Coast, North Coast, and eastern Sierra. These IBIs can now be used to evaluate attainment of aquatic life uses in these areas. IBIs for other areas of the State are currently under development.

Estuarine and coastal indicators: A benthic response index has been developed for use in offshore waters of Southern California. Response indices have also been developed for estuaries in Southern California and San Francisco Bay. The State is currently working on a standardized approach that would be applicable throughout the state. This effort is building upon data collected through Bay Protection and Toxics Cleanup Program, Coastal EMAP, Regional Monitoring Efforts in Southern California and San Francisco Bay. This effort is being funded in part through the sediment quality task force.

Wetland indicators: Significant progress has been made to calibrate and validate the California Rapid Assessment Method (CRAM). Significant progress has been made to calibrate and validate the California Rapid Assessment Method (CRAM). The attributes and metrics developed for CRAM reflect the common, visible characteristics of all wetlands in all regions of California. Sets of narrative statements reflect a gradient in the condition of the wetland and are related to the degree of stress affecting it. Stressors are identified using a stressor checklist, which enables wetland managers to identify which stressors are most likely to account for observed conditions within and among wetlands. Observed conditions can then form the foundation for more intensive, diagnostic follow-up using supplemental indicators (Level 3 monitoring). The CRAM has been successfully calibrated and validated in coastal wetlands in three coastal regions. The goal is to build upon the existing CRAM database to test the applicability of the CRAM for wetland throughout the state.

995
996
997
998
999
1000
1001
1002
1003
1004
1005
1006
1007
1008
1009
1010
1011
1012
1013
1014
1015
1016
1017
1018
1019
1020
1021
1022
1023
1024
1025
1026
1027
1028
1029
1030
1031
1032
1033
1034
1035
1036
1037
1038
1039
1040
1041
1042

Coastal beach availability: There is extensive monitoring of recreational beaches in California. State law requires the monitoring of beaches for total coliform, fecal coliform and enterococcus. The State also mandated a set of consistent assessment threshold for posting advisories. The State also reports regularly on the number of beach closures, postings, and rain advisories. Beach-mile days are the key indicator used to evaluate and track the extent of beaches affected by closures and postings. Beach-mile days is useful because it incorporates both spatial and temporal extent of the impairment. Issues of assessment methodology and consistency are effectively dealt with through the State Beach Water Quality Task Force.

Emerging contaminants of concern-endocrine disruption. Evidence is accumulating that documents the occurrence of endocrine disrupting chemicals in surface waters across the nation. Estrogenic endocrine disrupting chemicals (EEDCs), compounds that mimic or interfere with the reproductive function of estrogen, can have variable effects on fish, ranging from behavioral changes to feminization of males. The SWAMP is supporting development of water quality monitoring tools (endocrine disrupter assays) that can be used to screen surface waters for the presence and effects of endocrine disrupting chemicals. The current focus of the SWAMP endocrine disrupter assay work includes development and application of an economical short-exposure method capable of detecting low concentrations (5 – 10 ng/L) of EEDCs in ambient surface waters. The procedure involves exposing larval rainbow trout (*Oncorhynchus mykiss*) to water samples and analyzing their livers for vitellogenin mRNA (Vg) using SYBR Green or TaqMan® RT-qPCR (reverse-transcription quantitative polymerase chain reaction). The project is currently conducting initial screening level assessments on select ambient waterways. The ambient water assessments will take place through September 2005. Next steps include analyses and interpretation of data, preparation of final report, and further assessments in waterways suspected of containing EEDCs at concentrations that may threaten aquatic life.

Environmental Protection Indicators for California -EPIC The Environmental Protection Indicators for California (EPIC) Project was created to establish and implement a process for developing statewide environmental indicators. The EPIC Project is responsible for maintaining an environmental indicator system to assist environmental programs in evaluating the outcomes of their efforts, and in identifying areas that require more attention. During its first year, the EPIC Project identified significant environmental issues confronting California and generated an initial set of approximately 90 indicators for these issues. These issues were grouped in the following categories: air quality, water (quality, supply and use), waste management, pesticides, trans-boundary issues, human health, and ecosystem health.

The water quality indicators of EPIC are:

- Aquatic life and swimming uses assessed
- Spill/Release episodes
- Leaking underground fuel tank (LUFT) sites
- Drinking water supplies exceeding maximum contaminant levels (MCLs)
- Coastal beach availability – Extent of coastal beaches posted or closed
- Bacterial concentrations in commercial shellfish growing waters
- Fish consumption advisories - Coastal waters

Environmental indicators for surface waters have been drawn from existing water quality assessments, including the 305(b) report. The major influences on these indicators are not changes in water quality,

but are the inconsistent approaches used in developing the assessments and the very limited monitoring data for some water body types used in the assessments. The Water Boards have not used consistent guidelines in establishing the status of water bodies. At present, the available information cannot be used to make year-to-year comparisons. Appropriate monitoring designs are being developed to address this deficiency.

Implementation Priorities

The SWAMP Roundtable will revisit the selection of core and supplemental indicators as part of the refinement of monitoring objectives and design. Work will continue on the development and use of biological and habitat assessment methodologies. Participants in SWAMP will work with other entities to coordinate the use of indicators across monitoring scale and across programs.

Table 1. USEPA Recommended water quality indicators for general designated use categories

Recommended Core and Supplemental Indicators				
	Aquatic Life & Wildlife	Recreation	Drinking Water	Fish/Shellfish Consumption
Recommended Core Indicators	*Condition of biological communities (USEPA recommends the use of at least two assemblages) *Dissolved oxygen *Temperature *Specific Conductance *pH *Habitat assessment *Flow *Nutrients *Landscape conditions (e.g., % cover of land uses) Additional indicators for lakes: *Eutrophic condition Additional indicators for wetlands: *Wetland hydrogeomorphic settings and functions	*Pathogen indicators (E. coli, enterococci) *Nuisance plant Growth *Flow *Landscape conditions (e.g., % cover of land uses) Additional indicators for lakes: *Secchi depth *Nutrients *Chlorophyll Additional indicators for wetlands: *Wetland hydrogeomorphic settings and functions	*Trace metals *Pathogens *Nitrates *Salinity *Sediments/TDS *Flow *Landscape conditions (e.g., % cover of land uses)	*Pathogens *Mercury *Chlordane *DDT *PCBs *Landscape conditions (e.g., % cover of land uses)
Supplemental Indicators	*Ambient toxicity *Sediment toxicity *Other chemicals of concern in water column or sediment *Health of organisms	*Other chemicals of concern in water column or sediment *Hazardous chemicals *Aesthetics	*VOCs (in reservoirs) *Hydrophyllic pesticides *Nutrients *Other chemicals of concern in water column or sediment *Algae	*Other chemicals of concern in water column or sediment

Quality Assurance

Key Components and Essential Attributes

Our vision is to develop and implement a progressive quality assurance (QA) program using a systems-based approach to the generation and storage of application-appropriate data/metadata.

The key components of the SWAMP QA program are: a QA Management Plan (QMP), a QA Program Plan (QAPrP), QA Project Plans (QAPPs), a QA personnel team, QA reports to management, data verification and validation procedures, expert software, a QA toolbox, corrective action procedures, a QA calendar, and audit procedures for analytical laboratories, field sampling and Regional Water Board implementation of the SWAMP QMP. Components that will be added as additional funding becomes available are: inter-laboratory comparison and performance evaluation studies, assessments of monitoring, field and sampling plans, method detection limit studies, analytical method assessments, control charts, split sample assessments, QA training, and other detailed assessments of data quality and usability.

It is required that QMPs, QAPrPs and QAPPs are developed, maintained, and peer reviewed in accordance with EPA policy to ensure the scientific validity of monitoring and laboratory activities. The QMP and SWAMP QAPrP document how the State will plan, implement, and assess the effectiveness of its quality assurance and quality control operations.

Quality Assurance Project Plans document the planning, implementation, and assessment procedures for a particular project, as well as any specific quality assurance and quality control activities. These plans must reflect the level of data quality that is appropriate for the specific uses of the data, such as comprehensive assessment and listing of impaired waters, TMDL development, and NPS effectiveness. Data quality and quantity needs are expected to vary according to the consequences of the resulting water quality decisions.

Under 40 CFR 130.4(b), State monitoring programs are to include collection and analysis of physical, chemical, and biological data and quality assurance and control programs to ensure the data are scientifically valid. Under 40 CFR 31.45, if a grantee's project involves environmentally related measurements or data generation, the grantee must develop and implement quality assurance practices consisting of policies, procedures, specifications, standards, and documentation sufficient to produce data of adequate quality to meet project objectives and minimize loss of data due to out-of-control conditions or malfunctions.

A grantee that uses Section 106 funds for monitoring activities must include in its Quality Assurance Program a description of how:

- Each study or monitoring program objective is defined in specific qualitative and quantitative terms and linked to an environmental management decision or reporting requirement associated with the goals of the Clean Water Act.
- Selected indicators offer the most direct means of assessing the environmental attribute under study, based upon the associated requirement and goals of the Clean Water Act.
- The uncertainty associated with estimates and conclusions drawn from each component of the monitoring program are understood, quantified, and limited to a reasonable extent, commensurate with the potential costs (both monetary and environmental) of decision errors.

- The proposed sampling scheme will yield data that are representative of the environmental attribute under study, with consideration of statistical probabilities associated with sampling.
- The quality of the data is assessed and validated to ensure that the data quality objectives of the programs were met.

Goals and Objectives

Goal: Implement Quality Assurance Team to provide technical oversight and direction to SWAMP QA activities

- Establish QA Team
- Define roles and responsibility of team

Goal: Develop and document SWAMP DQOs

- Lead SWAMP Roundtable through the DQO process
- Re-assess the SWAMP DQOs on an annual basis

Goal: Evaluate QA/QC program including new methods and program changes against SWAMP DQOs

- Assess current SWAMP Measurement Quality Objectives (MQOs) against SWAMP DQOs and revise them as necessary
- Create/Revise SWAMP QMP and SWAMP QAPrP

Goal: Produce data of high consistency/comparability among projects of different scales

- Review QAPPs against SWAMP DQOs and MQOs and provide feedback

Goal: Produce defensible, credible data that meets SWAMP QMP/QAPrP

- Conduct intercomparison studies and performance evaluation tests (as funded)
- Conduct laboratory audits
- Verify data
- Data validation
- Direct production of control charts
- Produce QA Reports
- Conduct training workshops
- SOP Review and Approval
- Direct production of studies such as holding time studies, sample container studies, method development studies, method detection limit studies, etc. in order to produce technically defensible data

Goal: Integrate SWAMP QA/QC procedures in other State Water Board programs

- Develop timeline for integrating SWAMP standards
- Create a "QA Tool Box"
- Provide assistance and training
- Act as a QA consultant and liaison for other programs

Current Status

The QA Team was formed in January 2005 and consists of a QA Officer, QA Coordinator and several QA Specialists. The QA Officer leads the team and reports to the SWAMP Program Coordinator and

the Water Board QA Program Manager. Job descriptions on file for each member are on file and will be assessed on an annual basis. The QA Team designates a liaison for each Regional Water Board as well as for each testing parameter. The QA Team holds bi-monthly meetings and reports its progress to the SWAMP Round Table on a monthly basis. Starting September 2005, the QA Officer will produce quarterly reports that will be submitted to the SWAMP Program Coordinator and the Water Board QA Program Manager as well as other interested parties and organizations.

The QA Officer will lead the SWAMP Roundtable through the DQO process beginning in August 2005. In June 2005, the QA Team collected names for DQO Team candidates, mapped out a tentative timeline for DQO Team progress, and collected the relevant state and federal water policies. The QA Officer will use the method outlined in the US EPA document, *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*. This document provides a standard working tool for project managers and planners to develop DQOs for determining the type, quantity, and quality of data needed to reach defensible decisions.

The USEPA definition of the DQO process is “a seven-step planning approach to develop sampling designs for data collection activities that support decision making. This process uses systematic planning and statistical hypothesis testing to differentiate between two or more clearly defined alternatives” (US EPA, Office of Environmental Information, EPA/600/R-96/055, *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*, August 2000. pp.0-5). The DQO Team will begin by scoping the monitoring goals from various program offices since SWAMP is to serve the decision-making needs of multiple end-user groups and organizations. It is anticipated that the DQO process will be completed by June 2006. After SWAMP clarifies its DQOs, MQOs will be defined to meet the DQO requirements.

The QA Team formed focus groups in May 2005 to address each program testing parameter. There are six focus groups consisting of toxicity testing, organic analytes, inorganic analytes, conventional analytes, bioassessment studies, and field measurements. Each group is used as a resource for sample collection, analysis, reporting, and data assessment. The first task of the focus groups was to assess the SWAMP QMP/QAPP’s MQOs and the resulting DQIs. New MQO tables have been formulated and are available in draft format. The tables will be reviewed by the QA Officer in July 2005 and sent out to other programs, organizations and groups for comment.

The QA Team has begun revision of the current QMP/QAPP with the final first revision anticipated in November 2005. The resulting documents will be a QMP and a QAPrP. The current QMP/QAPP serves many groups and organizations and is now almost 6 years old. It is necessary to revise some of the tables and layout in order to make the document easier to use for the now larger and varied SWAMP audience. Further, some of the MQOs, personnel and organizations have changed. These updates will be made in the first revision. The second revision due June 2006 will incorporate a full revision in order to meet the new DQOs also due in June 2006.

The QA Team also reviews new and existing QAPPs for Regional Water Boards and provides comments through a spreadsheet and a narrative format. The QA Coordinator is the lead QA Team member for this procedure. Since January 2005, the QA Team has reviewed over 30 QAPPs. The QAPPs are judged against the SWAMP DQOs and MQOs and the EPA 24-element QAPP protocols. Through a private consultant, the QA Team is assisting in development of an expert software system for the generation of QAPPs.

1201 In addition, as part of a system-based approach, the QA Team has developed SWAMP-specific
1202 standard operating procedures for contract laboratory data verification/validation, data classification,
1203 QA Team data validation, corrective action reports, and laboratory, field and regional audits. All
1204 standard operating procedures are ground-tested prior to finalization and are re-assessed after 9 months
1205 of inception.

1206

1207 Implementation Priorities

1208

1209 The SWAMP QA program's priority activities for the next twelve months are:

1210

- 1211 • Lead the SWAMP Roundtable through the DQO process producing a DQO document
- 1212 • Revise the current QMP/QAPP as an update, simple reformatting, and correction of errors and
1213 omissions
- 1214 • Revise the second version of the QMP/QAPrP to incorporate new DQOs and the subsequent
1215 changes to the MQOs
- 1216 • Implement the SWAMP QMP/QAPrP
- 1217 • Develop SWAMP-compliant QA narratives for placement into requests for proposals and
1218 contracts
- 1219 • Implement the QA toolbox with internet, web access
- 1220 • Begin third-party QA Team validation of a percentage of data from the permanent side of the
1221 SWAMP database
- 1222 • Implement a corrective action report file
- 1223 • Finalize all QA Team standard operating procedures
- 1224 • Review QAPPs as needed
- 1225 • Develop experimental studies as needed and as directed by the SWAMP Program Coordinator
- 1226 • Continue laboratory audits
- 1227 • Develop a design for inter-laboratory comparison studies and performance evaluation tests
- 1228 • Educate the SWAMP Roundtable and participants on the best uses of QA components and
1229 quality control samples
- 1230 • Produce quarterly QA reports to management

1231

1232 The SWAMP QA Program's priority activities for the next thirty-six months are:

1233

- 1234 • Develop a system for management review of the DQOs and QA program.
- 1235 • Develop a system for method detection limit studies and their evaluation.
- 1236 • Develop a system for cataloging method modifications made by laboratories.
- 1237 • Implement field and regional auditing.
- 1238 • Develop a system for control charting.
- 1239 • Implement inter-laboratory comparison studies and performance evaluation tests.
- 1240 • Perform third-party data validation on a percentage of data using hardcopy reports.
- 1241 • Set-up a process to ensure that studies or monitoring program objectives are defined in specific
1242 qualitative and quantitative terms and linked to an environmental management decision or
1243 reporting requirement associated with the goals of the Clean Water Act.
- 1244 • Set-up a process to ensure that selected indicators offer the most direct means of assessing the
1245 environmental attribute under study, based upon the associated requirement and goals of the
1246 Clean Water Act.

- Develop a system and provide training to Regional Water Boards to ensure that the uncertainty associated with estimates and conclusions drawn from each component of the monitoring program are understood, quantified, and limited to a reasonable extent, commensurate with the potential costs (both monetary and environmental) of decision errors.
- Audit and review proposed sampling schemes to ensure they will yield data that are representative of the environmental attribute under study, with consideration of statistical probabilities associated with sampling.
- Develop a system for data quality assessment to ensure that the DQOs of the program were met.

Data Management

Key Components and Essential Attributes

Our vision is to make credible ambient monitoring data and information available to all stakeholders in a timely manner. The foundation for this cooperative information management system is a centralized storage database designed around a sample-driven model capturing geospatial data for every sample collected and designed to transfer data into larger data exchange networks. Water quality, toxicity, sediment chemistry, microbiological, habitat, biological, fish and shellfish tissue data, and metadata is associated with federal and state assessment units such as the National Hydrography Dataset (NHD), CalWater, and Regional Water Board Basin Plans.

SWAMP ambient monitoring data is accessible to SWAMP users via the primary database maintained at Moss Landing Marine Laboratories. Additionally, SWAMP data will be made available to the public through the California Environmental Data Exchange Network (CEDEN) maintained by the Department of Water Resources, with annual data uploads into STORET and the Environmental Information Exchange Network (EIEN) through CEDEN beginning in FY06-07. The long-term goal is to include SWAMP data in the California Integrated Water Quality System (CIWQS), which will store assessment information for CWA Section 305(b) reports and 303(d) lists.

Goals and Objectives

Goal: SWAMP ambient monitoring data will be stored, checked for quality assurance, and is comparable in the SWAMP database

Objectives:

- Establish and maintain an electronic data management system for integrating multiple ambient monitoring data types
- Develop guidelines and technical specifications for data organization, flow, and verification/validation to maintain SWAMP quality and comparability
- Load historic and current SWAMP monitoring data into the temporary side of the database
- Verify and validate data on temporary side and migrate it to the permanent side of the database

Goal: Provide training and tools to facilitate the use of SWAMP data and information by Water Board (intra-agency) and non-Water Board (inter-agency) programs

- Develop and provide program-specific training and tools to facilitate the use of SWAMP information by SWAMP participants to improve intra-agency coordination within the Water Board
- Facilitate intra- and inter-agency data comparability by developing and providing general use tools such as protocols and formats for electronic data transfer, procedures and tools for batch uploading of data, protocols and tools for data verification and validation, and query and analytical tools for summarizing and analyzing data

Goal: Integrate SWAMP data with information collected by Water Board (intra-agency) and non-Water Board (inter-agency) programs

- Develop framework for integrating SWAMP with CEDEN
- Develop framework for integrating SWAMP with CIWQS and GeoWBS
- Coordinate with the TMDL program on SWAMP formats, business rules, and training tools
- Coordinate with the Agricultural Waiver program on SWAMP formats, business rules, and training tools
- Coordinate with Grant Projects on SWAMP formats, business rules, and training tools
- Coordinate with volunteer monitoring groups to facilitate use of the SWAMP data management system
- Establish data server nodes at major data generators throughout the State (e.g., MLML, SCCWRP, SFEI) to serve as points of data consolidation for Water Board programs, data analysis, and public access of data
- Provide for incorporation of SWAMP metadata in the California Environmental Resource Evaluation System (CERES)
- Create links to STORET and EIEN through CEDEN to annually upload SWAMP data

Current Status

Development of the SWAMP data management system began in 2001 and is based on a Microsoft Access centralized storage database as a sample-driven model using a relational structure with standardized data transfer protocols (SDTP). This system is designed for enhanced data sharing, standardization, and data exchange amongst replicated databases while minimizing redundant data entry and possible data loss. The design is modular and flexible for adapting new tables and modules as needed. Tables for discrete field measurements, water column and sediment chemistry, and water column and sediment toxicity have been completed. Modules and data systems for metadata, bacteria indicators, fish and shellfish tissue residue (bioaccumulation), biological and habitat assessment, and continuous field measurements are in development and near completion.

Loading historic SWAMP data collected prior to the database development begun in FY03-04 and should be verified, validated, and transferred to the permanent side of the database by FY05-06. Historic data from Water Board monitoring programs such as the Toxic Substances Monitoring (TSM), State Mussel Watch (SMW), and Coastal Fish is hoped to be verified, validated, and transferred to the permanent side of the database by FY06-07 if funding becomes available. Loading SWAMP data collected after database development is an ongoing function with data first loaded to the temporary side where it is verified and validated before transfer to the permanent side. To date, the temporary side has been populated with over 260,000 data results from over 8,300 samples of discrete field measurements, water column and sediment chemistry, and water column and sediment toxicity. Data from FYs 00-01 and 01-02 will be verified, validated, and transferred to the permanent side of the database by the end of FY04-05 (June 2005).

Because the SWAMP database is designed around a sample-driven model capturing geospatial data for every sample, the data is linked to federal and state assessment units such as the National Hydrography Dataset (NHD), CalWater, and Regional Water Board Basin Plans. This link should help in producing the State's CWA 305(b) reports and 303(d) lists, and should complement the Geospatial Waterbody System (GeoWBS) that currently contains the state's assessment information.

The SWAMP Information Management Plan is a 'living document' updated periodically to provide standard protocols for data transfer, data submittal, data organization, and the milestones and

mechanisms by which the data will be made accessible to project participants, other organizations, and the general public. Other guideline and technical specification documents such as Standard Operating Procedures (SOPs) for data verification and validation and data submission formats have been developed and made available to SWAMP users and the public via the Internet. The Data Management Team has also provided training workshops, manuals for training and database use, and analytical and query tools to facilitate the use of the SWAMP database and data by Water Board (intra-agency) and non-Water Board (inter-agency) programs.

A group of major data generators from Moss Landing Marine Laboratories (MLML), Southern California Coastal Water Research Project (SCCWRP), the San Francisco Estuary Institute (SFEI), and other interested parties have been in discussion concerning the establishment of data server nodes throughout the state. However, lack of funding has kept progress at a slow pace.

The SWAMP Data Management Team is collaborating with the Department of Water Resources to develop the framework for the California Environmental Data Exchange Network (CEDEN) maintained by the Department of Water Resources. Preliminary beta tests transferring data to USEPA's STORET has occurred with the intent of moving SWAMP data from the permanent side to STORET by the end of 2005. With funding provided by the USEPA's Environmental Information Exchange Network (EIEN), CEDEN should be functional and integrated with EIEN in 2006.

Water quality assessment information for 305(b) reports and 303(d) lists are currently contained in the state's Geospatial Waterbody System (GeoWBS), which consists of geographic information stored in ArcView shape files and textual assessment information stored in a Microsoft Access 2000 database. Current plans are underway to integrate the functionality of GeoWBS, the System for Water Information Management (SWIM1), and the Electronic Self-Monitoring Reporting (ESMR) application into the Geotracker architecture to develop the CIWQS. CIWQS will contain GeoWBS modules that provide assessment information through existing GIS layers (GeoWBS Map Navigator) and provide a means for creating new GIS layers based on the National Hydrography Dataset (GeoWBS Map Editor). The SWAMP database is structured to readily provide monitoring data to GeoWBS and CIWQS to help the State and Regional Water Boards prepare fact sheets, 305(b) reports, and 303(d) lists.

Implementation Priorities

The SWAMP Data Management Team will continue database development to integrate multiple ambient monitoring data types such as continuous field measurements, and they will maintain and update the database as new technologies are developed. Beta testing the bioaccumulation (fish and shellfish tissue) and bioassessment databases will be completed and implemented. The DMT will continue to load SWAMP ambient monitoring data to the temporary side, verify and validate it, and then transfer it to the permanent side. The DMT will also continue to develop tools and training modules and to coordinate Water Board and non-Water Board programs to facilitate the use of the SWAMP database and data to increase data comparability throughout California. The SWAMP Data Management Team will also continue participating in the development of CEDEN and establish the framework necessary for making regularly scheduled data transfers to GeoWBS, CIWQS, and STORET through CEDEN to make the SWAMP ambient monitoring data available to the public in a timely manner.

Data Analysis and Assessment

Key Components and Essential Attributes

Our vision is to provide a consistent defensible framework for the evaluation of monitoring data relative to state and regional standards, the protection of beneficial uses and for tracking the effectiveness of management actions.

This will require a methodology for assessing attainment of water quality standards based on analysis of data types (chemical, physical, biological, land use) from various sources, for all waterbody types and all State waters. The methodology must describe how existing available data and information relevant to applicable water quality standards, including both core and supplemental indicators, will be compiled and analyzed to make attainment decisions. The methodology should:

- Identify the required or likely sources of existing and available data and information and procedures for collecting or assembling it;
- Describe or reference requirements relating to data quality and representativeness, such as analytical precision, temporal and geographical representation, and metadata documentation needs;
- Include or reference procedures for evaluating the quality of datasets; and
- Explain data reduction procedures (e.g., statistical analyses) appropriate for comparing data to applicable water quality standards.

Goals and Objectives

Goal: Develop a method for statewide assessment of beneficial uses (305(b) Report)

- Provide guidance on acquisition and use of primary and secondary data for assessments
- Provide guidance on data quality assessment process
- Provide guidance on thresholds for beneficial use assessment
- Prepare assessment

Goal: Develop a method for assessing standards attainment for listing purposes (303(d))

- Provide guidance on acquisition and use of primary and secondary data for assessments
- Provide guidance on translation/interpretation of narrative standards
- Implement State Listing policy
- Communicate decisions to 303(d) listing personnel
- Pursue listings/delistings where

Current Status

Water Board Listing Policy. Pursuant to California Water Code Section 13191.3(a), this State policy for water quality control (Policy) describes the process by which the State Water Board and Regional Water Boards shall comply with the listing requirements of Section 303(d) of the federal Clean Water Act (CWA). The goal of this Policy is to establish a standardized approach for developing California's Section 303(d) list. CWA Section 303(d) requires states to identify waters that do not meet applicable water quality standards after the application of certain technology-based controls. The methodology to be used to develop the Section 303(d) list [40 CFR 130.7(b)(6)(i)] is established by this Policy and includes:

- California Listing Factors and Delisting Factors;

1445 • the process for evaluation of readily available data and
1446 information; and
1447 • Total Maximum Daily Load (TMDL) priority setting and scheduling.
1448 This Policy applies only to the listing process methodology used to
1449 comply with CWA
1450 Section 303(d). In order to make decisions regarding standards
1451 attainment, this Policy provides guidance to interpret data and
1452 information by comparison to beneficial uses, existing numeric and
1453 narrative water quality objectives, and antidegradation
1454 considerations. The Policy shall not be used to:
1455 • determine compliance with any permit or waste discharge requirement
1456 provision;
1457 • establish, revise, or refine any water quality objective or
1458 beneficial use; or
1459 • translate narrative water quality objectives for the purposes of
1460 regulating point sources.

1461

1462 Implementation Priorities

1463

1464 An assessment methodology is being developed for classifying beneficial use status for individual
1465 water bodies that will integrate with the new listing policy. Beginning in 2007, the new methodology
1466 will be used for generating California's Integrated Report to satisfy the requirements of both CWA
1467 Section 305(b) and 303(d).

1468

1469

Reporting

Key Components and Essential Attributes

Our vision is to report all collected data as information, and in a timely and publicly accessible manner. This will require that the results of data analysis are disseminated by various means, for use by water quality managers and the public. Conveying results and information to information users needs to take many forms, depending upon the information need, timeliness sought, and the management style of the decision maker.

The Clean Water Act requires the State to provide certain reports and lists, including those listed below.

- The Section 305(b) water quality inventory report, which, characterizes the condition and quality trends of monitored waters within the State and is due on April 1 of even-numbered years. This is the primary State monitoring program report to USEPA and draws upon information from the Non-Point Source program, TMDLs, and other national, State, and local assessments.
- The Section 303(d) list identifies all impaired waters based on existing and readily available information. The list is also due on April 1 of even-numbered years.
- Development and submission of 305(b) water quality reports and Section 303(d) lists of impaired waters can be integrated. The Integrated Report will satisfy CWA reporting requirements for both Section 305(b) water quality reports and Section 303(d) lists.
- The annual data update requirement may be satisfied by uploading monitoring data to the national STORET warehouse or updating the 305(b) assessment information in the CIWQS which is compatible with the National Assessment Database.
- Section 406 of the Clean Water Act, as amended by the Beaches Environmental Assessment and Coastal Health Act of 2000, requires States with Section 406 grants to submit information on monitoring and notification programs for coastal recreation waters. Details on the California program are included in the Annual Clean Beach Initiative Report to the Legislature.

Goals and Objectives

Goal: Produce timely and complete water quality reports and lists as required by the Clean Water Act, and consistent with current USEPA guidance.

- Prepare 305(b) assessment
- Prepare 303(d) list
- Prepare Beach report

Goal: Report to the public on water quality, taking into account the needs of interested audiences. Use various formats and media such as brochures, fact sheets, report cards, oral presentations, and the Internet.

- Prepare fact sheets summarizing SWAMP elements.
- Prepare fact sheets summarizing state and regional beneficial use status.
- Re-design and begin improvement of SWAMP web site.

Goal: Produce technical reports and peer reviewed journal articles resulting from monitoring program activities.

- Prepare technical reports within two years of data collection.
- Complete preparation of reports from SWAMP monitoring conducted through 2003.

1517
1518 Current Status
1519

1520 A variety of reports are used to support SWAMP. Most of the reports are available to the public in
1521 paper and electronic form. The types of reports being produced include fact sheets, data reports, QA
1522 reports, interpretative reports, and the 305(b)/303(d) Integrated Report. These reports provide an
1523 analysis and interpretation of the data collected. The technical reports have written descriptions of the
1524 study design, methods used, graphical, statistical, and textual descriptions of the data, and
1525 interpretation of the data including comparisons to relevant water quality goals. Technical reports are
1526 being summarized in fact sheets that capture key findings in a more readable format.
1527

1528 The State needs to improve its ability to produce timely, complete and technically valid water quality
1529 reports and lists called for under CWA Sections 305(b) and 303(d). The listing policy and the upgrade
1530 to GeoWBS should facilitate this. To remain eligible for Section 106 grants, the State also must
1531 submit annual updates of water quality information. This is not occurring. This requirement will be
1532 satisfied by annually updating monitoring data to the national exchange network and STORET
1533 warehouse via the CEDEN exchange network beginning in FY 06-07.
1534

1535 Implementation Priorities
1536

1537 The regions vary in terms of how they have assessed and reported their monitoring data. The focus of
1538 the next year will be to complete technical reports for all regions. Because of resource constraints,
1539 several regions have focused on data collection instead of assessment and reporting. Beginning in
1540 FY05-06 the Roundtable will work towards timely reports produced within two years of data
1541 collection. If additional resources are obtained, results will also be submitted for publication in peer-
1542 reviewed journals.
1543

1544 In addition to technical summaries, the Roundtable recognizes the need for translating data into
1545 information for decision makers. This has been occurring informally at each of the Regions, where
1546 monitoring designs have been based on local information needs. Beginning in FY05-06 the
1547 Roundtable is committed to producing timely fact sheets to make information more accessible to all
1548 interested parties. In FY06-07 the SWAMP website will be re-designed to improve the public's access
1549 to monitoring information.
1550

1551 In FY 05-06 the Boards will approve the 2004-2006 303(d) list and staff will prepare the 2006 305(b)
1552 report. A report to the legislature is produced annually that summarizes coastal beach postings and
1553 closures.
1554
1555
1556

Programmatic Evaluation

Key Components and Essential Attributes

Our vision is to conduct periodic reviews of each aspect of the program to determine its scientific validity, if it is being implemented as designed, and how well it serves the water quality decision needs of the State.

This will require the Water Boards, in consultation with its USEPA Region 9, to conduct periodic reviews of each aspect of the SWAMP program to determine how well the program is being implemented and how well it serves the water quality decision needs for all State waters, including all water body types. This must include evaluating the monitoring program to determine how well each of the 10 elements is addressed, and determining how needed changes and additions are incorporated into future monitoring cycles. This evaluation will take into consideration the effects of funding shortfalls on implementation of the monitoring program strategy.

SWAMP should be evaluated as part of a continuous improvement feedback loop. This may include, for example, undertaking audits focused on implementation of the monitoring program objectives, quality assurance protocols, laboratory procedures, and data assessment procedures.

Goals and Objectives

Goal: Ensure that program is being implemented as designed.

- Review annual workplans to ensure that all are addressed in workplans
- Use information from QA/QC audits to document extent of compliance with elements

Goal: Ensure that program is meeting needs of programs

- Annual evaluation by SWAMP
- Annual evaluation by USEPA
- Periodic evaluation by program offices

Goal: Ensure that program is technically sound

- Triennial review by SPARC
- Develop and implement process to respond to SPARC

Current Status

Currently, the SWAMP program receives input, review and guidance from a number of entities. The program needs to develop and implement an evaluation program that meets goals and objectives, and utilizes the existing entities already formed to assist the program.

SWAMP Roundtable: Coordination of SWAMP is achieved through monthly meetings of the SWAMP Roundtable. The Roundtable is composed of State and Regional Water Board staff and representatives from other agencies and organizations including the Department of Fish and Game, the Marine Pollution Studies Lab, and the University of California. Interested parties, including members of other agencies, consultants, or other stakeholders are welcome to participate. Roundtable members provide programmatic, technical and logistical support and guidance on the implementation of the program.

Generally, decisions are made by consensus. It must be noted that the strength of the current program resides in the Roundtable. Together, the skills, knowledge, abilities and perspectives of the individual members combine to form a coordination entity stronger than its individual participants.

Watershed Technical Advisory Committees: Some regions have elected to receive reviews and coordinate their watershed assessments by relying on locally appointed technical advisory committees (TAC). The TAC functions vary and may include planning and/or review. Although effective for individual regions, their inconsistent implementation among regions limits their overall program value.

AB 982 Public Advisory Group (PAG): Formed in response to AB 982, the PAG is an advisory stakeholder group composed of 12 representatives of the discharger community and 12 representatives from environmental organizations. SWAMP is required to implement all consensus recommendations of the PAG. The PAG had a major role in the original SWAMP design, but has not been active in almost two years.

Scientific Planning and Review Committee (SPARC): An external scientific panel, the Scientific Planning and Review Committee (SPARC), was organized by SWAMP to review monitoring objectives, design, approaches, indicators, and other relevant topics. Committee members are representatives from federal and state agencies and academics with expertise in fields such as monitoring program management, monitoring design, ecology, chemistry, quality assurance, pathogens, toxicology and statistics. An external peer review is scheduled for the end of 2005.

Implementation Priorities

Waste Discharge Permit Fees (WDPF) Workgroup: Beginning in FY 03-04, SWAMP has been supported through a monitoring surcharge on Waste Discharge Permit Fees. This group has requested input on the design and implementation of the program. The program needs to establish the requested stakeholder group. However, the Roundtable is seeking input from a group with broader make-up than just regulated dischargers. Technical experts, the regulated community, environmental groups and Water Board staff should all be part of the committee. The first meeting is scheduled for Spring 2006.

The Roundtable will establish and implement a systems approach to program evaluation in FY05-06. This will include annual evaluation of program elements and peer review of all monitoring plans and technical reports.

General Support and Infrastructure

Key Components and Essential Attributes

Our vision is to provide the support needed to implement a coordinated and comprehensive monitoring and assessment program.

This will require the resources to maintain the existing program and it will require the identification of current and future resources needs to fully implement the SWAMP strategy. As part of an ongoing triennial review and planning process, the following needs should be assessed, considering current conditions and planned improvements.

- Identify the required number of staff needed for the SWAMP program implementation.
- Identify needed laboratory support to perform scientifically appropriate documented methods.
- Identify training needs for program implementation, including for field, laboratory, data management, and data assessment staff.
- Identify required funding (e.g., for salaries, training, travel, equipment, laboratory analysis) for implementing the program, along with anticipated sources and amounts of funding and the effects of any shortfalls.

As part of its overall Strategy, SWAMP will optimize the use of available resources to leverage funding and maximize the generation of useful information.

Goals and Objectives

Goal: Update the SWAMP Needs Assessment

Goal: Promote Coordination and Comparability

- Continue monthly meetings of SWAMP Roundtable.
- Establish a stakeholder group to providing guidance to Roundtable.
- Actively participate in the NPS Tracking and Monitoring Council.
- Engage regulated community to maximize National Pollution Discharge Elimination System (NPDES) and Waste Discharge Requirements (WDR) monitoring comparability with SWAMP.
- Expand the role of Volunteer Monitoring and the Clean Water Team in SWAMP.
- Continue participation in NWQMC.
- Identify, develop and implement joint projects with partners.
- Participate in web-based applications for tracking monitoring entities.
- Expand SWAMP component of Water Board Training Academy to include courses for all stakeholders and interested parties.

Current Status

SWAMP is currently funded at approximately seven percent of what was originally estimated in the 2000 Needs Assessment. The lack of adequate resources has seriously limited what the program can accomplish. It is highly unlikely that the program will ever have the resources described in 2000. The development of this Strategy is seen as a critical first step at designing a more cost efficient program.

1686 Implementation Priorities

1687

1688 SWAMP resource needs were identified in November 2000. This needs assessment needs to be
1689 updated to describe the proposed strategy funding and staff needs, as well as training, laboratory
1690 resources, and infrastructure needs. This will be completed during FY06-07.

1691

Core Implementation Priorities

The ten elements of the SWAMP strategy are integrated through the implementation of four overarching priorities that parallel the USEPA priority actions for monitoring.

The Strategy incorporates the operating principles, monitoring goal (Goal #6), monitoring objectives and strategies of the Strategic Plan. The Strategy integrates four overarching tactics to promote an efficient increase in the amount of usable water quality information that is available, as follows:

- Improve and strengthen SWAMP so that all Water Board programs generate credible, comparable and comprehensive information by using a monitoring framework and data standards consistent with the guidance developed by the NWQMC.
- Develop and promote the use of multiple monitoring tools such as statistically-based surveys, judgmental surveys, predictive modeling, risk assessments, expert systems, and newer information and monitoring technologies.
- Continue working with monitoring programs currently coordinated through the California Environmental Data Exchange Network hosted by the Department of Water Resources. This coordination will increase data comparability, increase the potential for true collaboration with other entities collecting ambient water quality information and will make data available to the public. (This third tactic will also contribute to the fourth tactic below.)
- Build stronger partnerships with agencies, watershed groups, citizen monitors, and others to facilitate the sharing of information, the collection of comparable data and the use of monitoring tools. This includes working closely with the newly formed Nonpoint Source Tracking and Monitoring Council.

Implementing these four priorities has been the focus of the statewide SWAMP effort for the past three years. Specific actions to continue implementation that involve multiple strategy elements are summarized below:

Priority Action

1. Gradually strengthen state and regional programs:

a. Implement the NWQMC Monitoring Framework. (Objectives, Design, Data Management, Data Analysis/Assessment, Reporting) The monitoring framework is the product of the National Water Quality Monitoring Council (NWQMC). The framework was designed to meet the data and information challenges facing water quality management today and closely follow the 10 elements of the USEPA Elements document. The purpose of the monitoring framework is that it permits a general, and common, comprehension of the diverse activities involved in monitoring. Such an understanding is critical to the production of scientifically sound, consistent and comparable water quality information required to support fair and equitable water quality decision making” (AWWA 2003). The framework consists of six phases: (1) Develop specific objectives; (2) Design monitoring program; (3) Collect field and laboratory data; (4) Compile and manage data; (5) Assess and interpret data; and (6) Convey findings and evaluate program. The monitoring framework is described more fully in Appendix F.

Although each of these phases seems obvious, we are not consistently nor sufficiently addressing each phase. SWAMP will use the monitoring framework to guide the activities of the program by identifying, connecting, and prioritizing specific aspects of the various framework elements to ensure that all components are included, balanced, connected, and collectively focused on producing quality information.

b. Conduct Prioritization Exercise for Monitoring Objective Implementation: Specific tasks for the next three years include:

- Complete the process of clearly defining the water-resource assessment questions. These water quality issues or questions determine monitoring objectives. The objectives determine the monitoring design. The Roundtable is outlining the decisions that will be made from the data and then identifying the data (or monitoring) needed to make the decision. (Objectives, Design)
- Examine the status of existing state and regional programs: Existing monitoring programs will be cataloged for their management questions and the current and potential abilities to address specific monitoring objectives related to water body type and beneficial use assessment. This task will be initiated in FY04-05 and completed in FY05-06. The NPS Monitoring Council will be asked to add to the catalog. Catalog format and parameters will be consistent with the format being developed by the NWQMC. (Design)
- Identify gaps, weaknesses, and redundancies of the state's monitoring programs. (Design)
- Identify gaps and weaknesses in Basin Planning and Standard Development. (Indicators)
- Prioritize objectives⁶. (Objectives, Design)
- Conduct technical peer review. Following the prioritization exercise and the development of objectives and an appropriate monitoring design, submit the strategy to the SWAMP SPARC for evaluation before implementation. (Program Evaluation).

c. Continue development and implementation of comparable design, sampling and analysis procedures: Specific tasks for the next three years include:

- Develop and implement a comparable approach for regional watershed assessments to maximize the information gained from all SWAMP monitoring. Currently, 12 different approaches are used for conducting watershed assessments. One region has four separate approaches. A common approach needs to be developed that promotes greater statewide consistency and comparability while still being flexible enough for regional Water Boards to focus on region-specific issues. This has been a particularly contentious issue for the SWAMP Roundtable, largely due to the lack of sufficient funding for a comprehensive approach, but also because the Regions feel that the ability to address region-specific issues should be paramount. In general, the Regions do not support the need for comparability among regional programs simply for the sake of consistency; they want to focus the available funding on addressing key issues at the regional scale, which differ from region to region and often require different monitoring methods. Further, SWAMP is an umbrella program, which the Regions use to coordinate their region-specific monitoring efforts and collaborate with other existing programs and monitoring projects. Coordination and collaboration

⁶ Several states and other entities have excellent monitoring programs that can serve as models for SWAMP to consider facilitating development of a technically defensible prioritization scheme. For example, EPA Region 5 and Florida have implemented tiered monitoring approaches. The New England states have implemented a probabilistic survey of 344 of their 11,000 lakes to "jump start" their lake monitoring program. The SCCWRP Bight program demonstrates how regionally the same level of investment can produce a more complete picture if coordinated.

with other programs and stakeholders requires flexibility in monitoring approaches. (Objectives, Design, Indicators)

- Produce second edition of the SWAMP QMP. (Quality Assurance)
- Complete summary of current field methods, relevant data quality objectives and training tools. (Standard Operating Procedures and training CD ROM) (Quality Assurance)
- Develop and implement a system for the performance-based comparison of methods.
- Develop and implement systems for quality assurance audits of laboratories, field activities and Water Board Programs (Quality Assurance)
- Develop and implement systems for data verification and validation processes. (Quality Assurance and Data Management)
- Develop query tools for SWAMP database (Data Management and Data Assessment)
- Develop and implement assessment and reporting guidance (Design and Reporting)
- Expand SWAMP component of Water Board Training Academy (General Support and Infrastructure Planning)
- Develop and implement processes for evaluating program implementation, program effectiveness and technical validity. (Programmatic Evaluation)
- Gradually increase the number of Water Board programs that utilize SWAMP standards and guidance.

d. Expand use of predictive tools; landscape models: (Design, Indicators and Assessment)

There will never be sufficient resources to individually monitor all water bodies for attainment of all beneficial uses. More information than can be measured is required for comprehensive water resource management. Therefore, a critical step in providing a cost-effective understanding of water quality is to begin development and verification of predictive tools and models. Such tools and models are needed to extrapolate or forecast conditions to unmonitored, yet comparable areas—both spatially and temporally.

- As part of a comprehensive monitoring design, include pilot projects that rely on predictive tools, landscape models and expert systems.
- Plan for increased use of predictive models and tools as part of first strategy revision.

Priority Action 2: Encourage integrated use of multiple monitoring methods and tools

Specific tasks for the next three years include:

- Expand the application of consistent monitoring approaches across regions to address regional and statewide objectives. These may include both probabilistic and rotational watershed designs. (Design)
- Facilitate the use of new technologies and tools for QA. (Quality Assurance)
- Facilitate the use of new technologies and tools for field monitoring, i.e. remote sensing, use of multi-meters and satellite images. (General Support and Infrastructure Planning)
- Facilitate the use of new technologies and tools for information management, i.e. Personal Digital assistant (PDAs) for field data entry; Electronic Data Formats (EDFs) for batch uploads of lab data, expert systems for planning and assessment. (Indicators, Quality Assurance, Data Management, General Support and Infrastructure Planning)
- Provide appropriate training for developing data quality objectives, monitoring design, monitoring technology and tools. (General Support and Infrastructure Planning)

Priority Action 3: Expand accessibility and use (comparability) of data:

SWAMP is making excellent progress in this area. Specific tasks for the next three years include:

- Complete database development. (Data management, Data Analysis/Assessment)
- Complete data reporting documentation. (Data management)
- Implement metadata guidance. (Data management)
- Continue method performance studies. (Quality Assurance)
- Develop field performance criteria. (Quality Assurance)
- Gradually increase the number of Water Board programs that utilize SWAMP standards and guidance. (General support and infrastructure)
- Continue partnering with the Department of Water Resources to use the CEDEN. (Data management, Reporting)
- Continue coordination with other monitoring efforts. (Design, Indicators, Assessment)
- Provide relevant, timely, and cost-effective information to the Legislature, decision makers, stakeholders, and citizens about ambient water quality conditions. (Reporting)

Priority Action 4: Promote partnerships: (all elements)

Each phase of the monitoring strategy requires communication, coordination, and collaboration (the "3C's" as referred to by NWQMC. The "3 Cs" indicate the importance of inclusiveness in the monitoring process, and move us closer to monitoring that is consistent, comparable, and scientifically defensible. The resulting information is more accessible and facilitates sound decision making by all stakeholders. This will be enhanced by including other entities as partners in monitoring efforts as well as encouraging appropriate public participation throughout the monitoring process.

The formation of the California Nonpoint Source Tracking and Monitoring Council (Monitoring Council) and the further development of the California Environmental Data and Exchange Network (CEDEN) will assist with the "3C's." The Monitoring Council was initiated in 2005 by the Water Board and California Coastal Commission, in cooperation with U.S. EPA, to help improve water quality monitoring and implementation tracking at many levels (e.g., from local watershed organizations to state and federal agencies and the private sector), and enhance efforts to address nonpoint source pollution and protect designated uses. For more information refer to the Monitoring Council Charter in Appendix D.

SWAMP has a number of ongoing and proposed approaches to enhance monitoring partnerships.

- Continue monthly meetings of SWAMP Roundtable.
- Establish a stakeholder group to providing guidance to the Roundtable.
- Actively participate in the NPS Tracking and Monitoring Council.
- Engage regulated community to maximize NPDES and WDR monitoring comparability with SWAMP.
- Expand the role of Volunteer Monitoring and the Clean Water Team in SWAMP.
- Continue participation in NWQMC.
- Identify, develop and implement joint projects with partners.
- Participate in web-based applications for tracking monitoring entities.

- 1872
- 1873
- 1874
- Expand SWAMP component of Water Board Training Academy to include courses for all stakeholders and interested parties.

1874
1875
1876
1877
1878
1879
1880
1881
1882
1883
1884
1885
1886
1887
1888
1889
1890
1891
1892
1893
1894
1895
1896
1897

Literature Cited

AWRA, 2003. Water Resources Impact. AWRA, Middleburg, VA

Bernstein, B. B., B. E. Thompson and R.W. Smith. 1993 A combined science and management framework for developing regional monitoring objectives. Coastal Management 21: 185-195.

State Water Resources Control Board, 2000. Report to the Legislature, “Proposal for a Comprehensive ambient surface water quality monitoring program.” State Water Board, Sacramento, CA.

State Water Resources Control Board, 2001. Strategic Plan: A Vision for the Future. California Water Boards, Sacramento, CA.

California Water Boards, 2004. Water Quality Control Policy for Developing California’s Clean Water Act Section 303(d) List. California Water Boards, Sacramento, CA.

USEPA, 2003. Elements of a State Water Monitoring and Assessment Program. USEPA, Washington, D.C.

AMENDED IN SENATE APRIL 4, 2005

SENATE BILL

No. 1070

Introduced by Senator Kehoe
(Coauthor: Senator Alquist)

February 22, 2005

An act to amend Section 13269 of the Water Code, relating to An act to amend Sections 13167 and 13225 of, and to repeal and add Section 13181 to, the Water Code, relating to water.

LEGISLATIVE COUNSEL'S DIGEST

SB 1070, as amended, Kehoe. Water quality: ~~waivers~~ *information*.

(1) Existing law, the Porter-Cologne Water Quality Control Act ~~provides that a state board or a regional board may waive certain waste discharge requirements for specific discharges or specific types of discharges if the waiver is consistent with any applicable state or regional water quality control and is in the public interest.~~

~~This bill, in addition, would require that a waiver does not pose a significant threat to the beneficial uses of the waters of the state,~~ *requires the State Water Resources Control Board, in conjunction with the California regional water quality control boards, to implement a public information program on matters involving water quality and to maintain an information file on water quality research and other pertinent matters.*

This bill would require the state board to place on its Web site a public information file on water quality research, standards, regulation, enforcement, and other pertinent matters, as prescribed.

(2) *The act requires the state board, to the extent that funds are available, to prepare and complete, on or before January 1, 2000, an inventory of existing water quality monitoring activities within state coastal watersheds, bays, estuaries, and coastal waters.*

This bill would repeal that provision and would require the California Environmental Protection Agency and the Resources Agency, on or before December 1, 2006, to enter into a memorandum of understanding for the purposes of establishing the California Water Quality Monitoring Council, which the state board would be required to administer. The bill would require the memorandum of understanding to describe the means by which the monitoring council will work to (a) reduce redundancies, inefficiencies, and inadequacies in existing data collection programs and (b) ensure that sufficient information is collected to track improvements in water quality and evaluate the effectiveness of programs administered by the state board or the regional boards and other water quality improvement projects in achieving clean water and healthy ecosystems. The bill would require the monitoring council to undertake various actions relating to data collection. The bill would require the Secretary of the California Environmental Protection Agency, beginning December 1, 2008, to conduct a biennial audit of the effectiveness of a specified monitoring and assessment network developed and implemented by the monitoring council.

Vote: majority. Appropriation: no. Fiscal committee: yes.
State-mandated local program: no.

The people of the State of California do enact as follows:

1 ~~SECTION 1. Section 13269 of the Water Code is amended to~~
2 ~~read:~~
3 *SECTION 1. The Legislature finds and declares all of the*
4 *following:*
5 *(a) The Legislative Analyst's Office has concluded that*
6 *ambient water quality monitoring is the foundation for much of*
7 *the work of the State Water Resources Control Board, including*
8 *basin planning, standards setting, and permitting.*
9 *(b) The Government Accounting Office has determined that*
10 *the United States Environmental Protection Agency (EPA) and*
11 *the states need comprehensive water quality monitoring and*
12 *assessment information on environmental changes and*
13 *conditions over time and that, in the absence of this information,*
14 *it is difficult for the EPA and the states to establish priorities,*
15 *evaluate the success of programs and activities, and report on*
16 *accomplishments.*

1 (c) *The National Research Council has similarly*
2 *recommended the development of a uniform, consistent approach*
3 *to ambient water quality monitoring and data collection,*
4 *increased resources for water monitoring, and improved*
5 *coordination of monitoring.*

6 (d) *According to California's biennial monitoring report to the*
7 *EPA, the state can only report on the health of 22 percent of its*
8 *coastal shoreline, 34 percent of its lakes and reservoirs, and 15*
9 *percent of its rivers and streams. There is no single place where*
10 *the public can go to get a specific look at the health of water*
11 *bodies in its own backyard, or even to get an overall picture of*
12 *the health of the state's waters.*

13 (e) *State board funding for ambient surface water monitoring*
14 *has decreased significantly over the years. The efforts that are*
15 *underway could be enhanced significantly if the state effectively*
16 *coordinates the many separate monitoring activities that are*
17 *going on at the local, state, and federal levels, but different*
18 *protocols and agency interests have precluded coordination of*
19 *the data.*

20 (f) *The development of new programs to control agricultural*
21 *and timber pollution, and the implementation of hundreds of new*
22 *projects financed by bond funds to improve water quality, may*
23 *produce water quality improvements that will essentially go*
24 *unmeasured without significant improvements in the*
25 *coordination, integration, and funding of water quality*
26 *monitoring. The State of California cannot afford to waste the*
27 *opportunities provided by these and other water quality*
28 *improvement programs.*

29 (g) *Numerous water monitoring efforts are conducted by local,*
30 *state, and federal agencies, regulated entities, and citizen*
31 *monitoring groups. Many of these efforts are uncoordinated, and*
32 *as a result funds and information are not being used as*
33 *effectively as they could be. In addition, redundant monitoring*
34 *activities can occur because of a lack of basic information*
35 *relative to the scope of monitoring activities throughout the state.*
36 *For example, there are 100 water quality monitoring efforts*
37 *underway in the central valley alone, and coordination is*
38 *minimal.*

39 (h) *The state's Nonpoint Source Pollution Monitoring Council*
40 *should be expanded to provide a complete, coordinated picture*

1 of current and changing water health throughout the state, to
2 inform the public with regard to safe use of its waters, and to
3 report to the public on the success of efforts to protect and
4 restore those waters.

5 (i) Federal funding and funding from other sources is
6 available to make sure that the State of California improves its
7 monitoring efforts so that Californians have a better
8 understanding of the health of the state's waters. Additional
9 support can be found through the savings provided by increased
10 coordination and integration of existing monitoring efforts.

11 (j) Californians should be able to readily access basic
12 information that already exists about the state's waters and how
13 those waters are protected and restored. By their recent approval
14 of a constitutional amendment (Proposition 59), California
15 voters have indicated their strong support for open and
16 transparent government. The "government" of state waters
17 should be carried out in a similarly open manner. At a minimum,
18 all information that is currently available to agencies should be
19 made readily available to the public via the Internet.

20 SEC. 2. Section 13167 of the Water Code is amended to read:

21 13167. (a) The state board shall implement a public
22 information program on matters involving water quality, and
23 shall maintain and place on its Web site, in a format accessible to
24 the general public, an information file on water quality research,
25 standards, regulation, enforcement, and other pertinent matters.

26 (b) The information file described in subdivision (a) shall
27 include, but need not be limited to, information relating to
28 permits, waste discharge requirements, waivers, reports, lists,
29 charts, standards, objectives, agreements, enforcement actions,
30 and other information and documents prepared pursuant to
31 Sections 13164, 13170.1, 13181, 13240, 13241, 13243, 13260,
32 13263, 13266, 13267, 13269, 13320, 13323, 13376, 13377, and
33 13399.27. To the maximum extent practicable given available
34 funding, the state board, in consultation with the regional
35 boards, shall ensure that the information is available in single
36 locations, rather than separately by region, and that the
37 information is presented in a manner easily understandable by
38 the general public.

39 SEC. 3. Section 13181 of the Water Code is repealed.

1 13181. (a) ~~For the purposes of this section, the following~~
2 ~~terms have the following meanings:~~

3 (1) ~~“Coastal waters” means waters within the area bounded by~~
4 ~~the mean high tide line to the three-mile state waters limit, from~~
5 ~~the Oregon to the Mexican borders.~~

6 (2) ~~“Coastal watersheds” means the watersheds of tributary~~
7 ~~waters that drain to the ocean and significantly influence coastal~~
8 ~~water quality.~~

9 (b) (1) ~~To the extent that funds are available for that purpose,~~
10 ~~the state board shall prepare and complete on or before January~~
11 ~~1, 2000, an inventory of existing water quality monitoring~~
12 ~~activities within state coastal watersheds, bays, estuaries, and~~
13 ~~coastal waters. The information generated by preparing the~~
14 ~~inventory shall be made available as a report, and as an~~
15 ~~Internet-based index, that is available to the general public. A~~
16 ~~summary of the results shall be made available to the Legislature.~~
17 ~~The inventory shall include, but not be limited to, descriptions of~~
18 ~~all of the following:~~

19 (A) ~~The sources of monitoring data, including federal, state,~~
20 ~~and local governments, the private sector, citizen groups, and~~
21 ~~nonprofit organizations.~~

22 (B) ~~The monitoring methods being used by these sources.~~

23 (C) ~~The location of the monitoring sites.~~

24 (D) ~~Existing efforts to investigate the discharge of nonvolatile~~
25 ~~organic pollutants, including trace metals and nontarget organic~~
26 ~~chemicals, through storm drains into Santa Monica Bay, San~~
27 ~~Francisco Bay, Humboldt Bay, and San Diego Bay.~~

28 (2) ~~Notwithstanding any other provision of law, the state board~~
29 ~~shall carry out paragraph (1) by contracting with institutions with~~
30 ~~expertise in coastal water quality monitoring, which may include~~
31 ~~the Southern California Coastal Water Research Project and the~~
32 ~~San Francisco Estuary Institute, to undertake the inventory.~~

33 (c) (1) ~~To the extent that funds are available for that purpose,~~
34 ~~the state board, not later than January 1, 2001, shall prepare and~~
35 ~~submit to the Legislature a report that proposes the~~
36 ~~implementation of a comprehensive program to monitor the~~
37 ~~quality of state coastal watersheds, bays, estuaries, and coastal~~
38 ~~waters and their marine resources for pollutants, including, but~~
39 ~~not limited to, bacteria and viruses, petroleum hydrocarbons,~~
40 ~~heavy metals, and pesticides, as defined in Section 12753 of the~~

~~Food and Agricultural Code. The proposed program shall utilize information available through the sources identified in paragraph (1) of subdivision (b), as appropriate, and shall avoid the duplication of existing and ongoing monitoring efforts to the extent feasible. The proposed program shall include, but not be limited to, all of the following:~~

~~(A) To the extent possible, a determination regarding the extent to which existing water quality objectives, sediment quality guidelines, tissue contaminant burden guidelines, and health standards are being met. Where information is not available to make this determination, the report shall identify methods for determining this information.~~

~~(B) To the extent possible, a determination regarding the sources of pollution in areas where objectives, standards, and guidelines are not being met. Where information is not available to make this determination, the report shall identify methods for determining this information.~~

~~(C) Methods for determining the degree of improvement or degradation in coastal water quality over time with respect to these objectives, guidelines, and standards.~~

~~(D) To the extent possible, estimates of the total discharges of pollutants into state coastal watersheds, bays, estuaries, and coastal waters from all sources.~~

~~(E) Standard protocols for sampling and data collection methods, to maximize the usefulness of the data resulting from the program.~~

~~(F) Recommendations for a standard format for reporting monitoring results to maximize access to and use of the data.~~

~~(G) The estimated costs of implementing the program and the proposed schedule of implementation.~~

~~(H) A description of the method by which the state board shall provide biennial reporting to the public on water quality within the state's coastal watersheds, bays, estuaries, and coastal waters; and recommended actions that should be undertaken to maintain and improve water quality in those areas.~~

~~(I) A description of the method by which the state board shall develop a system for monitoring mass contaminant discharges, including, but not limited to, heavy metals, PCBs, PAHs, and pesticides from storm water at the point of discharge. The system shall provide for the appropriate frequency of monitoring for~~

1 ~~each specific contaminant. The system shall be designed to~~
2 ~~identify the relative contribution of contaminants in storm water~~
3 ~~to the overall anthropogenic discharges into near coastal waters.~~
4 ~~To the extent possible, the system shall be designed to determine~~
5 ~~the effectiveness of best management practices in reducing the~~
6 ~~discharges of contaminants to near coastal waters.~~

7 ~~(2) The state board shall consult with the San Francisco~~
8 ~~Estuary Institute and the Southern California Coastal Water~~
9 ~~Research Project to prepare the report. Notwithstanding any other~~
10 ~~provision of law, the state board may carry out paragraph (1) by~~
11 ~~contracting with institutions with expertise in coastal water~~
12 ~~quality monitoring, including, but not limited to, the Southern~~
13 ~~California Coastal Water Research Project and the San Francisco~~
14 ~~Estuary Institute, to prepare the report. The state board or its~~
15 ~~contractors shall convene workshops, symposia, and other~~
16 ~~professional and scientific meetings for the purpose of~~
17 ~~developing a consensus on the part of regulatory agencies and~~
18 ~~dischargers with regard to the appropriate methods to be used to~~
19 ~~monitor water quality on a statewide basis.~~

20 ~~(d) The state board shall not use more than 5 percent of the~~
21 ~~funds allocated to implement subdivisions (b) and (c) for the~~
22 ~~administrative costs of the contracts permitted under those~~
23 ~~provisions.~~

24 *SEC. 4. Section 13181 is added to the Water Code, to read:*

25 *13181. (a) On or before December 1, 2006, the California*
26 *Environmental Protection Agency and the Resources Agency*
27 *shall enter into a memorandum of understanding for the*
28 *purposes of establishing the California Water Quality*
29 *Monitoring Council, which shall be administered by the state*
30 *board. The ____ shall determine the composition of the*
31 *monitoring council. The monitoring council shall include*
32 *representatives from state agencies with responsibilities for*
33 *water quality monitoring. The purpose of the monitoring council*
34 *shall be to coordinate the water quality monitoring efforts of*
35 *federal, state and local government, institutions of higher*
36 *education, representatives of the regulated community, citizen*
37 *monitoring groups, and other interested parties, to develop a*
38 *coordinated, integrated, comprehensive network for collecting*
39 *and disseminating water quality information and assessments.*
40 *Among other things, the memorandum of understanding shall*

1 *describe the means by which the monitoring council shall do*
2 *both of the following:*

3 *(1) Work to reduce redundancies, inefficiencies, and*
4 *inadequacies in existing data collection programs in order to*
5 *improve the effective delivery of sound, comprehensive*
6 *information to the public and decisionmakers.*

7 *(2) Ensure that sufficient information is collected to track*
8 *improvements in water quality and evaluate the overall*
9 *effectiveness of programs administered by the state board or the*
10 *regional boards, and water quality improvement projects*
11 *financed by the state or the federal government, with regard to*
12 *achieving clean water and healthy ecosystems.*

13 *(b) The monitoring council shall report annually to the*
14 *California Environmental Protection Agency and the Resources*
15 *Agency as to its recommendations for maximizing the efficiency*
16 *and effectiveness of water quality data collection and*
17 *dissemination, to ensure that sufficient data are maintained and*
18 *available for use by decisionmakers and the public. The*
19 *monitoring council shall consult with the United States*
20 *Environmental Protection Agency in preparing these*
21 *recommendations. The monitoring council's recommendations,*
22 *and any responses submitted by the California Environmental*
23 *Protection Agency or the Resources Agency to those*
24 *recommendations, shall be made available to decisionmakers*
25 *and the public via the Internet.*

26 *(c) The monitoring council shall undertake and complete, on*
27 *or before March 1, 2007, an inventory of existing water quality*
28 *monitoring and data collection efforts statewide and make that*
29 *information available to the public.*

30 *(d) All entities of the state, including institutions of higher*
31 *education to the extent permitted by law, that collect water*
32 *quality data or information shall cooperate with the state board*
33 *in the development and implementation of the memorandum of*
34 *understanding to develop a coordinated, efficient, and effective*
35 *statewide water quality data collection, dissemination, and*
36 *assessment network.*

37 *(e) The coordinated monitoring and assessment network*
38 *developed and implemented by the monitoring council shall*
39 *include all of the following components:*

1 *(1) A comprehensive monitoring program strategy that utilizes*
2 *and expands upon the state's existing monitoring capabilities*
3 *and describes how the state will develop an integrated*
4 *monitoring program that will serve all of the state's water*
5 *quality monitoring needs and address all of the state's waters*
6 *over time. The strategy shall include a timeframe with milestones*
7 *that will ensure completion of the strategy within 10 years. The*
8 *strategy shall be comprehensive in scope and identify the*
9 *technical, integration, and resource needs that are currently*
10 *impediments to an adequate monitoring program, and*
11 *recommend solutions to those issues so that the strategy will be*
12 *implemented within the 10-year timeframe.*

13 *(2) Monitoring objectives that will ensure a program that is*
14 *efficient and effective in generating data that facilitate*
15 *management decisions and public information needs.*

16 *(3) An approach and rationale for selection of coordinated*
17 *monitoring designs and sites that most efficiently and effectively*
18 *serve the monitoring objectives.*

19 *(4) Core indicators selected to represent applicable water*
20 *uses, and supplemental indicators, as needed, for particular*
21 *pollutants of concern. Core indicators may include, but need not*
22 *be limited to, physical/habitat, chemical/toxicological, and*
23 *biological/ecological endpoints, that are appropriate for use in*
24 *assessing attainment of water quality standards throughout the*
25 *state. Core indicators developed pursuant to the environmental*
26 *protection indicators for California reports shall be given high*
27 *priority as core indicators for purposes of this coordinated*
28 *monitoring and assessment network.*

29 *(5) Quality management plans and quality assurance plans*
30 *that ensure the validity and utility of the data collected.*

31 *(6) An accessible and user-friendly electronic data system for*
32 *water quality, fish tissue, toxicity, sediment chemistry, habitat,*
33 *biological and other data, with timely data entry and ready*
34 *public access via the Internet. To the maximum extent possible,*
35 *the geographic location of the assessment units shall be*
36 *consistently defined using the national hydrography dataset, or*
37 *other similar locator.*

38 *(7) Methodology for compiling, analyzing, and integrating all*
39 *readily available information, including but not limited to, data*

1 *acquired from discharge reports, volunteer monitoring groups,*
2 *and local, state, and federal agencies.*

3 *(8) Production of timely and complete water quality reports*
4 *and lists that are required under Sections 303(d), 305(b), 314*
5 *and 319 of the Federal Water Pollution Control Act and Section*
6 *406 of the Beaches Environmental Assessment and Coastal*
7 *Health Act of 2000 Act, that include all available information*
8 *from discharge reports, volunteer monitoring groups, and local,*
9 *state, and federal agencies.*

10 *(9) An update of the state board's surface water ambient*
11 *monitoring program needs assessment in light of the benefits of*
12 *increased coordination and integration of information from other*
13 *agencies and information sources. This update shall include*
14 *identification of current and future resource needs required to*
15 *fully implement the coordinated, comprehensive monitoring*
16 *network, including, but not limited to, funding, staff, training,*
17 *laboratory and other resources, and projected improvements in*
18 *the network.*

19 *(f) Data, summary information, and reports prepared pursuant*
20 *to this section shall be made available to appropriate public*
21 *agencies and the public by means of the Internet.*

22 *(g) (1) Commencing December 1, 2008, the Secretary of the*
23 *California Environmental Protection Agency shall conduct a*
24 *biennial audit of the effectiveness of the monitoring and*
25 *assessment network and the monitoring council established*
26 *pursuant to this section. The audit shall include an assessment of*
27 *the effectiveness of the monitoring and assessment program and*
28 *the monitoring council in tracking improvements in water*
29 *quality, evaluating the overall effectiveness of programs*
30 *administered by the state board or a regional board and of state*
31 *and federally-funded water quality improvement projects.*

32 *(2) The Secretary of the California Environmental Protection*
33 *Agency shall consult with the Secretary of the Resources Agency*
34 *in preparing the audit, consistent with the memorandum of*
35 *understanding entered into pursuant to subdivision (a).*

36 *(h) The state board shall prioritize the use of federal funding*
37 *that may be applied to monitoring, including, but not limited to,*
38 *funding under Section 106 of the Federal Water Pollution*
39 *Control Act, for the purpose of implementing this section.*

1 *(i) The state board shall not use more than 5 percent of the*
2 *funds made available to implement this section for the*
3 *administrative costs of any contracts entered into for purpose of*
4 *implementing this section.*

5 SEC. 5. *Section 13225 of the Water Code is amended to read:*

6 13225. Each regional board, with respect to its region, shall:

7 (a) Obtain coordinated action in water quality control,
8 including the prevention and abatement of water pollution and
9 nuisance.

10 (b) Encourage and assist in self-policing waste disposal
11 programs, and upon application of any person, advise the
12 applicant of the condition to be maintained in any disposal area
13 or receiving waters into which the waste is being discharged.

14 (c) Require as necessary any state or local agency to
15 investigate and report on any technical factors involved in water
16 quality control or to obtain and submit analyses of water;
17 provided that the burden, including costs, of such reports shall
18 bear a reasonable relationship to the need for the report and the
19 benefits to be obtained therefrom.

20 (d) Request enforcement by appropriate federal, state and local
21 agencies of their respective water quality control laws.

22 (e) Recommend to the state board projects which the regional
23 board considers eligible for any financial assistance which may
24 be available through the state board.

25 (f) Report to the state board and appropriate local health
26 officer any case of suspected contamination in its region.

27 (g) File with the state board, at its request, copies of the record
28 of any official action.

29 (h) Take into consideration the effect of its actions pursuant to
30 this chapter on the California Water Plan adopted or revised
31 pursuant to Division 6 (commencing with Section 10000) of this
32 code and on any other general or coordinated governmental plan
33 looking toward the development, utilization or conservation of
34 the water resources of the state.

35 (i) Encourage regional planning and action for water quality
36 control.

37 (j) *Comply with the public information requirements set forth*
38 *in Section 13167.*

39 ~~13269. (a) (1) On and after January 1, 2000, the provisions~~
40 ~~of subdivisions (a) and (c) of Section 13260, subdivision (a) of~~

1 ~~Section 13263, or subdivision (a) of Section 13264 may be~~
2 ~~waived by the state board or a regional board as to a specific~~
3 ~~discharge or type of discharge if the state board or a regional~~
4 ~~board determines, after any necessary state board or regional~~
5 ~~board meeting, that the waiver is consistent with any applicable~~
6 ~~state or regional water quality control plan, does not pose a~~
7 ~~significant threat to the beneficial uses of the waters of the state,~~
8 ~~and is in the public interest. The state board or a regional board~~
9 ~~shall give notice of any necessary meeting by publication~~
10 ~~pursuant to Section 11125 of the Government Code.~~

11 ~~(2) A waiver may not exceed five years in duration, but may~~
12 ~~be renewed by the state board or a regional board. The waiver~~
13 ~~shall be conditional and may be terminated at any time by the~~
14 ~~state board or a regional board. The conditions of the waiver~~
15 ~~shall include, but need not be limited to, the performance of~~
16 ~~individual, group, or watershed-based monitoring, except as~~
17 ~~provided in paragraph (3). Monitoring requirements shall be~~
18 ~~designed to support the development and implementation of the~~
19 ~~waiver program, including, but not limited to, verifying the~~
20 ~~adequacy and effectiveness of the waiver's conditions. In~~
21 ~~establishing monitoring requirements, the regional board may~~
22 ~~consider the volume, duration, frequency, and constituents of the~~
23 ~~discharge; the extent and type of existing monitoring activities,~~
24 ~~including, but not limited to, existing watershed-based,~~
25 ~~compliance, and effectiveness monitoring efforts; the size of the~~
26 ~~project area; and other relevant factors. Monitoring results shall~~
27 ~~be made available to the public.~~

28 ~~(3) The state board or a regional board may waive the~~
29 ~~monitoring requirements described in this subdivision for~~
30 ~~discharges that it determines do not pose a significant threat to~~
31 ~~water quality.~~

32 ~~(4) (A) The state board or a regional board may include as a~~
33 ~~condition of a waiver the payment of an annual fee established by~~
34 ~~the state board in accordance with subdivision (f) of Section~~
35 ~~13260.~~

36 ~~(B) Funds generated by the payment of the fee shall be~~
37 ~~deposited in the Waste Discharge Permit Fund for expenditure,~~
38 ~~upon appropriation by the Legislature, by the state board or~~
39 ~~appropriate regional board for the purpose of carrying out~~
40 ~~activities limited to those necessary to establish and implement~~

1 the waiver program pursuant to this section. The total amount of
2 annual fees collected pursuant to this section shall not exceed the
3 costs of those activities necessary to establish and implement
4 waivers of waste discharge requirements pursuant to this section.

5 (C) In establishing the amount of a fee that may be imposed on
6 irrigated agriculture operations pursuant to this section, the state
7 board shall consider relevant factors, including, but not limited
8 to, all of the following:

9 (i) The size of the operations.

10 (ii) Any compliance costs borne by the operations pursuant to
11 state and federal water quality regulations.

12 (iii) Any costs associated with water quality monitoring
13 performed or funded by the operations.

14 (iv) Participation in a watershed management program
15 approved by the applicable regional board.

16 (D) In establishing the amount of a fee that may be imposed
17 on silviculture operations pursuant to this section, the state board
18 shall consider relevant factors, including, but not limited to, all of
19 the following:

20 (i) The size of the operations.

21 (ii) Any compliance costs borne by the operations pursuant to
22 state and federal water quality regulations.

23 (iii) Any costs associated with water quality monitoring
24 performed or funded by the operations.

25 (iv) The average annual number of timber harvest plans
26 proposed by the operations.

27 (5) The state board or a regional board shall give notice of the
28 adoption of a waiver by publication within the affected county or
29 counties as set forth in Section 6061 of the Government Code.

30 (b) (1) A waiver in effect on January 1, 2000, shall remain
31 valid until January 1, 2003, unless the regional board terminates
32 that waiver prior to that date. All waivers that were valid on
33 January 1, 2000, and granted an extension until January 1, 2003,
34 and not otherwise terminated, may be renewed by a regional
35 board in five-year increments.

36 (2) Notwithstanding paragraph (1), a waiver for an onsite
37 sewage treatment system that is in effect on January 1, 2002,
38 shall remain valid until June 30, 2004, unless the regional board
39 terminates the waiver prior to that date. Any waiver for onsite
40 sewage treatment systems adopted or renewed after June 30,

1 2004, shall be consistent with the applicable regulations or
2 standards for onsite sewage treatment systems adopted or
3 retained in accordance with Section 13291.

4 (e) Upon notification of the appropriate regional board of the
5 discharge or proposed discharge, except as provided in
6 subdivision (d), the provisions of subdivisions (a) and (e) of
7 Section 13260, subdivision (a) of Section 13263, and subdivision
8 (a) of Section 13264 do not apply to a discharge resulting from
9 any of the following emergency activities:

10 (1) Immediate emergency work necessary to protect life or
11 property or immediate emergency repairs to public service
12 facilities necessary to maintain service as a result of a disaster in
13 a disaster-stricken area in which a state of emergency has been
14 proclaimed by the Governor pursuant to Chapter 7 (commencing
15 with Section 8550) of Division 1 of Title 2 of the Government
16 Code.

17 (2) Emergency projects undertaken, carried out, or approved
18 by a public agency to maintain, repair, or restore an existing
19 highway, as defined in Section 360 of the Vehicle Code, except
20 for a highway designated as an official state scenic highway
21 pursuant to Section 262 of the Streets and Highways Code,
22 within the existing right-of-way of the highway, damaged as a
23 result of fire, flood, storm, earthquake, land subsidence, gradual
24 earth movement, or landslide within one year of the damage.
25 This paragraph does not exempt from this section any project
26 undertaken, carried out, or approved by a public agency to
27 expand or widen a highway damaged by fire, flood, storm,
28 earthquake, land subsidence, gradual earth movement, or
29 landslide.

30 (d) Subdivision (c) is not a limitation of the authority of a
31 regional board under subdivision (a) to determine that any
32 provision of this division shall not be waived or to establish
33 conditions of a waiver. Subdivision (c) shall not apply to the
34 extent that it is inconsistent with any waiver or other order or
35 prohibition issued under this division.

36 (e) The regional boards and the state board shall require
37 compliance with the conditions pursuant to which waivers are
38 granted under this section.

39 (f) Prior to renewing any waiver for a specific type of
40 discharge established under this section, the state board or a

1 ~~regional board shall review the terms of the waiver policy at a~~
2 ~~public hearing. At the hearing, the state board or a regional board~~
3 ~~shall determine whether the discharge for which the waiver~~
4 ~~policy was established should be subject to general or individual~~
5 ~~waste discharge requirements.~~

O